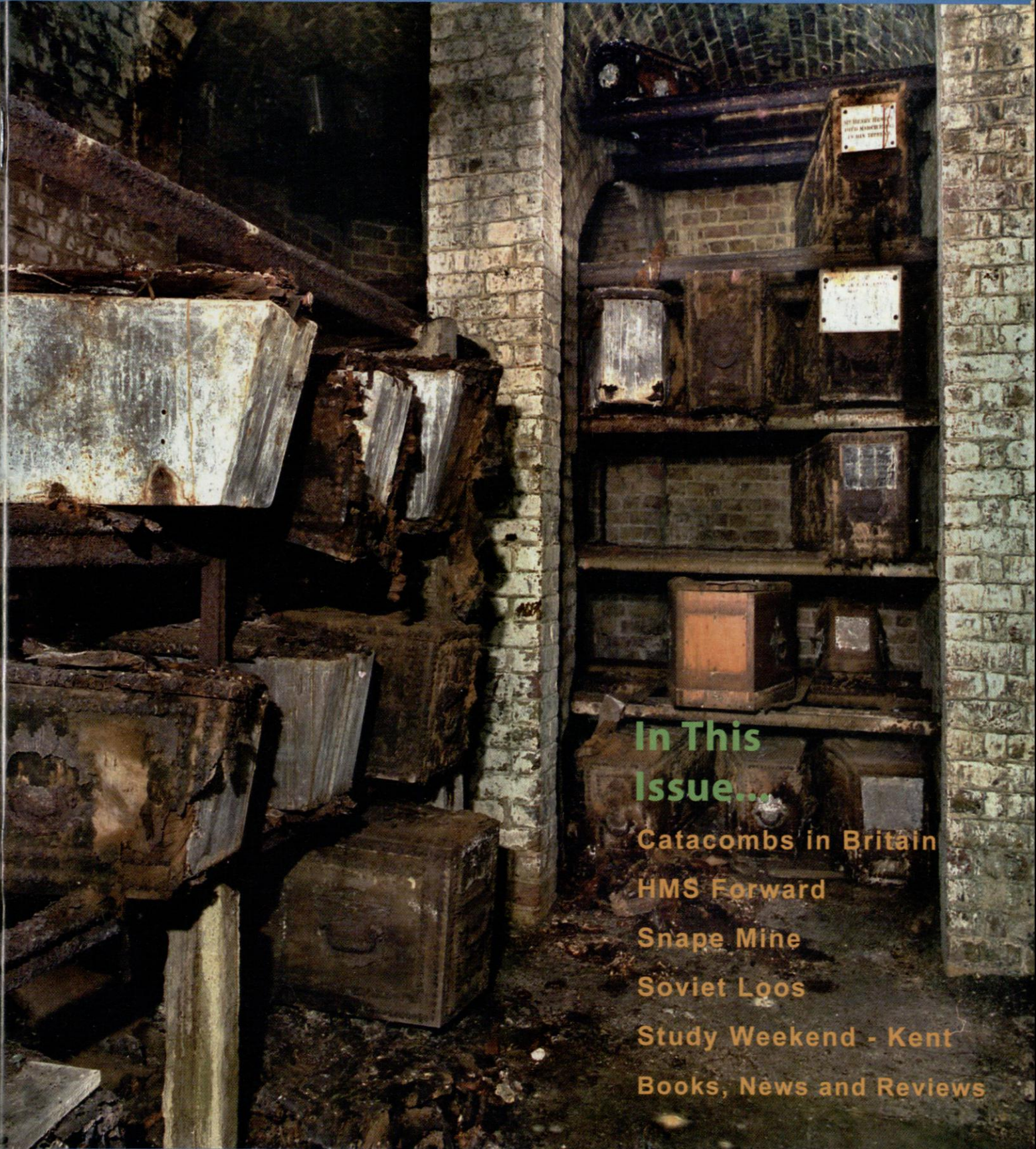


Subterranea

December 2009 Issue 21

ISSN 1741-8917

£4.00



In This Issue...

Catacombs in Britain

HMS Forward

Snape Mine

Soviet Loos

Study Weekend - Kent

Books, News and Reviews

The Magazine of Subterranea Britannica

www.subbrit.org.uk



Subterranea Britannica is a society devoted to the study of man-made and man-used underground structures and the archaeology of the Cold War. In the case of Cold War structures studies are entirely confined to declassified and decommissioned structures. The society is open to all and its membership includes all walks of life. Members are invited to contribute to this magazine even if this just means sending very welcome snippets from newspapers and magazines.

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Front cover photo: Catacombs beneath the demolished Episcopal Chapel at West Norwood Cemetery.
This view shows Catacomb 84 looking north in 1998

Back Upper: Stairway to the lower landing at the unfinished North End underground station on London's Northern Line

Back Lower: The western air lock looking into the central operations area in HMS Forward in Newhaven
All above photos by Nick Catford

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Newsletters of Subterranea Britannica are published by the committee of Subterranea Britannica. Original articles, book reviews, press cuttings, extracts from books and journals, letters to the Editor etc are welcome.

However the Editor reserves the right not to publish material without giving a reason.

The committee of Subterranea Britannica and the Editor do not necessarily agree with any views expressed and cannot always check the accuracy of any material sent in.

Printed by Hillary Press Ltd. 75 Church Road Hendon London NW4 4DP
Telephone: (020) 8203 4508 Fax: (020) 8203 0671

Subterranea Britannica A Company limited by Guarantee Registered in England Registration No. 6447148
Registered Office: 5 Railway Cottages, Old Station Way, Bordon, Hampshire GU35 9HH



From the Chairman Martin Dixon

The recent SFES Conference was a truly international affair. A French Society with a Belgian President meeting in Luxembourg. Attendees represented eight different nations and one of the visits was to Schengen where, in 1985, the agreement was signed permitting free movement between most EU countries. The SFES Conference itself will be featured in the next issue, but it set me thinking how important the International dimension is to *Subterranea Britannica*.

When Sub Brit was first created in 1974, it was heavily modelled on existing European underground societies including SFES. Study and exploration of underground space in mainland Europe has always been more common and accepted than in the UK although I think the gap is steadily closing. Right from the word 'go' Sub Brit has maintained and developed relationships (often exchange membership) with similar societies.

Actions speak louder than words, however, and visits to overseas sites by Sub Brit have grown and grown over the years. We have had an 'official' annual Sub Brit trip to northern Europe for the last decade but this is just the tip of the iceberg. Members have organised trips far and wide, from the Atlantic Wall just across the Channel to

the submarine pens of Sevastopol in the Ukraine. We are grateful to Sub Brit members who live outside the UK (Mike Barton and Lars Hansson to name but two) who have actively organised visits to their home territory. Keeping an eye on 'no frills' carriers on the internet means it often costs more to get to the airport than it does to fly to most places in Europe.

Individual members have travelled even further afield and it is a rare edition of *Subterranea* that does not contain details of some far-flung nugget. Many countries (Turkey, Spain, USA, Australia for example) offer the chance to live underground for a while — surely the ultimate high (or low!) for a Sub Brit member. Next time you're thinking of a visit abroad then share the costs and the fun by advertising to other members via email.

Finally, as you travel abroad for business or pleasure, make sure you carry the mantle for Sub Brit. Encourage local enthusiasts to join the society — details and current rates are always on the website. Write a short article on sites you have visited for *Subterranea* or post details to the email list.

There's a hole new world out there!

SUBTERRANEA BRITANNICA DIARY

Summary of Forthcoming Events 2010

Sub Brit specific events

- 23 January SB Committee meeting
- 17 April Spring Day Conference and AGM, Imperial College, London
- 1 March Copy deadline for *Subterranea* 22
which will be published in April 2010
- 20 March Hack Green open day for Sub Brit
- May 2010 Date to be confirmed Paddock (standby Cabinet War Room)
Open Day Dollis Hill
- 7 – 10 May European weekend in Maastricht
(Booking Form is enclosed with this *Subterranea*)
- 3 – 5 September Sub Brit UK Study Weekend probably Cornwall
- 18 September Paddock (standby Cabinet War Room)
Open Day Dollis Hill

Other underground-related events

- 24 April SERIAC Conference, Chertsey, Surrey
- 4 – 6 June NAMHO (National Association of Mining History Organisations)
Conference, Coalpit Heath, South Gloucestershire
- 9 – 12 September Heritage Open Days across UK
- 18 – 19 September London Open House



Dan McKenzie 1965–2009 – a Tribute

Martin Dixon

Dan McKenzie, a long term and active member of Subterranea Britannica, tragically died on September 12 – just a few weeks short of what would have been his 44th birthday. Daniel Charles McKenzie – always Dan to us – was well known to many and a friend to all.

Dan joined Sub Brit in late 1998 and got involved from the word go. He quickly got to know other members through attending conferences and trips. I first met



Dan when he attended a trip to V-weapon sites in France that Linda and I organised in May 1999. Dan's wife Alison came on the trip too. That was Alison's first and virtually her last Sub Brit trip. Whether this was because she judged Dan to be in safe hands, or because she thought we were all completely mad isn't entirely clear. Perhaps it was a bit of both.

From then on, Dan was an ever-present livewire who put huge amounts of effort into Subterranea Britannica. I remember someone once saying that vision without action was merely a dream and that action without vision was a nightmare. Well, Dan had both the vision and the action – the ideas and the execution. Dan organised large numbers of trips – in particular to the Maginot Line, to UK RAF Stations, to the former East Germany and to Sweden. Dan welcomed new members as warmly as old friends.

But besides these well-publicised trips, Dan did a huge amount more for Sub Brit – often behind the scenes. He joined the Committee and helped steer our society for a number of years. I remember Dan organised for the Committee to meet in the improbable setting of a glue factory in Peterborough. As Dan might have said, we're always likely to achieve more if we stick together!

But as anyone who has worked for societies such as Sub Brit knows, the real work is done outside of formal Committee meetings; and this is where Dan came into his own. He was hugely instrumental in extending Sub Brit's interests and knowledge to cover Cold War sites – many of which were of course still classified in Sub Brit's early days. He produced 'Siren', a Cold War newsletter, and worked hard to integrate this growing area with the rest of our interests. In 2003 Dan became the first Editor of *Subterranea* which was a huge step up from our previous newsletters. *Subterranea* will remain a lasting tribute to Dan's energies. He also set up his bunkertours website through which he shared his enthusiasm and knowledge with others.

But despite these important and lasting physical records, what we will miss above all is Dan's personality. Never down-hearted, his enthusiasm and sense of humour rubbed off on everyone that he came into contact with. On one trip

Dan set himself the challenging target of making a German immigration official smile. Needless to say, he succeeded. On another occasion Dan made a flight booking for Andrew Smith but doctored the receipt to show it was for a child. After a frantic phone call even Andrew saw the funny side. Whether it was someone he had met for the first time or a long term friend, Dan always made time to talk and was superb company.

Dan was born and spent all of his life in Peterborough but his travel ambitions started from an early age. Whilst at school he saved his pocket and dinner money in order to travel on the railways far and wide. When he got his first car, he helped pay for petrol by charging his younger sister Fiona for lifts to and from dances. He never lost the driving bug and once bought an ex East German armoured vehicle on eBay. His neighbours didn't share his enthusiasm and eventually it had to go. He was a dedicated driver on overseas trips – especially if he could get hold of a 4X4 or a car with 'Sports' mode.

Dan served for a number of years as a Sergeant in the Territorial Army and much enjoyed their exercises. He was a great supporter of the 'Vulcan to the Sky' campaign and admitted to having a tear in his eye on seeing and hearing XH558 airborne again after 14 years grounded. Very fittingly, Dan's family asked for donations to the campaign trust instead of flowers at his funeral.

Sub Brit was well represented at Dan's funeral, with around 30 members helping support Dan's family and each other. It made me feel very proud to be a member of a Society whose members have formed such enduring friendships and who care so much for each other. I had the honour of speaking at the funeral as did Jane MacGregor and Andrew Smith. Dan has left a deep and lasting impression on many, many people.

As well as combining vision with action, Dan also combined passion with compassion. He coupled huge amounts of enthusiasm with kindness and care for all he met. A man whose interests would never over-ride his love for his family, or his loyalty to friends.

Recognising Dan's fascination with underground space and the Cold War led his family to decide upon an unusual and touching final resting place. Dan's ashes were scattered in the grounds of one of his favourite bunkers. Fellow Sub Brit members helped facilitate this, Dan's last Bunker Tour.

Our sympathy is with Dan's parents, Rita and Mac, and his sister Fiona. But above all our hearts go out to Dan's wife Alison and his son Cameron. They shared their lives with a marvellous man who died before his time.

Jim Wright Martin Dixon

We are sorry to have to announce the sudden death of James ('Jim') Wright of Ealing who recently passed away. Jim had been a *Subterranea Britannica* member since 2001 and took part in a number of organised trips. He was particularly knowledgeable about railway rolling stock both above and below ground. He put this knowledge to great use on our trips to Paris when he was able to identify and date stock on the Metro and describe running practices through the Channel Tunnel for the group. I have written to Jim's family on behalf of Sub Brit, expressing our sympathy and condolences on their unexpected and sad loss.

Notes from the Committee Meeting held on 10 October 2009

First Aid Training – following the article in the last edition of *Subterranea*, three members have contacted us. These people will be subsidised upon completion of successful training.

Mailings – the committee discussed the most economic way of keeping members fully informed about our activities and agreed to consolidate mailings where possible. It was agreed that consideration would be given to sending information electronically to those who prefer this, which would reduce mailing costs. This could include information and booking forms for day conferences, study weekends, European trips and (in the future) paperwork for the AGM. The possibility of payment for these activities through PayPal will also be investigated. The *Subterranea Britannica* website will include a list of recent mailings, which will assist members in checking that they have not missed any communications.

Study weekends 2010 – The committee propose that the UK weekend should take place over the weekend 3-5 September, and will be located in Cornwall where there are a number of sites which should appeal to a wide range of interests. Further information will be circulated when details of accommodation and visit locations are finalised. Work is already underway on the European trip, which will take place on 7-10 May, in Maastricht. Paul Sowan is working with Joep Orbons on the programme.

Membership – we are fast approaching a total of 1,000 members, which is our highest ever. When we reach this figure, it was agreed that *Subterranea Britannica* should try to achieve some media coverage.

Subterranea Britannica Collection – work is continuing on the scanning and recording of documents and photos, and additional material has recently been obtained to add to the collection. Online access for subscribers is currently being finalised, and those concerned will be advised when this is possible.

Conferences – the Spring Day Conference/2010 AGM will be held at Imperial College on 17 April, and the committee decided that a more northern location should be chosen for the Autumn Day Conference, in recognition of the fact that members were located throughout the UK (albeit with a heavy bias towards the Greater London area). Brian Hillman is stepping down as organiser, and will be replaced by Tim Robinson.

Charitable Incorporated Status – a sub-group has been formed and will meet to progress achieving Charitable status.

Next Committee meeting – will be held on 23 January 2010, and members who wish to raise any matters for discussion are invited to send details to the Secretary by 1 January 2010.

NEWS – ARCHAEOLOGY

Man eats man in cave, Devon

Re-examination of a human arm bone excavated in Kent's Cavern, Torquay, by William Pengelly [1812 – 1894] in 1866 has led to speculation that inhabitants of the cave may have been cannibals. The bone has signs of butchering, in the form of seven cut marks made by a sharp-edged stone tool. The cuts are consistent with defleshing of the forearm, which had been fractured after death but while the bone was still fresh. Such features are relatively rare in European prehistory, but have also been recorded at Gough's Cave in Cheddar Gorge in the Mendip Hills in Somerset. An alternative theory is that the owner of the forearm had died some way from home, and was defleshed and his or her bones broken to render the corpse more easily portable back to the cave for ritual burial. The Kent's Cavern forearm was that of an adult, and dated to 9000 BC.

SOURCE: ANON, 2009, Cannibalism in prehistoric Devon? *Current Archaeology* 20(7)(235), page 6.

Further note on an enigmatic structure and possible underground space between Cowgate Cemetery and the Drop Redoubt at Western Heights, Dover Paul W. SOWAN

During the recent East Kent Study Weekend I took the opportunity to discuss the chimney-like structure at Dover's Western Heights (described in *Subterranea* 20 (2000) page 7) with Paul Wells of the Western Heights Preservation Society. His suggestion is that the structure is a sewer vent. He tells me he has noted two further similar structures elsewhere on the heights. This would seem to imply a deep and steeply sloping sewer running from the Drop Redoubt, below the defensive ditch and the Cowgate Cemetery towards the town. Such a tunnel would necessarily have been tunnelled through the chalk, rather than cut-and-cover. Presumably the barracks accommodation within the Drop Redoubt did have provision for ablutions and lavatories, implying both water

supply and waste disposal. A far greater requirement for sanitary arrangements was of course called for at the nearby but now demolished Grand Shaft Barracks, but the obvious route for sewage disposal from there would have been straight to the cliffs and down to beach level.

More information on Roedean School's tunnel through the cliffs at Brighton, Sussex

Martin Snow has drawn attention to the fact that Roedean School's tunnel made through the chalk cliffs at Brighton in 1911 to give the pupils access to the beach has been open to visitors during a recent Heritage Open Day. The tunnel, he reports, is three feet wide and contains a long flight of steps with occasional landings. The lower end appears to have been truncated by engineering works to create the Undercliffe Walk in the 1930s, and perhaps also by natural erosion, and is now guarded by a heavy steel door at the top of a short external flight of steps. No visible trace remains of the former boat-house excavated into the foot of the cliffs.

SOURCE: SNOW, Martin, 2009, Roedean tunnel. *Newsletter Sussex Industrial Archaeology Soc.* 144, page 11.



Roedean Tunnel - Photo by Nick Catford

Unexplained rock-cut tunnel discovered at the site of the Old Dock, Liverpool

Liverpool developed from an inconsequential riverside village to become Britain's second largest port. Archaeological excavations on the site of the Old Dock, where this development began in or about 1715, are revealing insights into the city's early development as a significant port. The Old Dock was infilled in 1826, when larger and deeper docks were created along the Mersey. Re-excavation of the Old Dock has revealed an entirely unexpected rock-cut tunnel, about 1.8 metres high, and reportedly sloping downwards, away from the dock. It appears that no attempt has been made to penetrate or explore beyond the bricked-up entrance. Inserted into the brickwork is an elm pipe, complete with an elm plug or stopper. This large tunnel appears not to be merely a drain from the town. Such a drain, brick-lined and complete with a wooden frame for a sluice gate, is also

reported. A photograph of this feature appears in the report. The authors suggest that the tunnel pre-dates the dock, and 'may have provided a secret route down to the Pool from the nearby castle.'

SOURCE: QUARTERMAINE, Jamie, and Carline RAYNOR, 2009, The Old Dock: how Liverpool grew to greatness. *Current Archaeology* 20(5)(233), 12 – 21.

NEWS – CONSERVATION, HERITAGE AND MUSEUMS

Consultation Draft: Geodiversity of London: a fake lead mine, a dene hole, and two chalk mines

A bulky document recently issued by the Greater London Authority documents sites throughout Greater London assessed for their geological importance. This is a valuable and up-to-date overview of the geology of this area, although not without errors. The full geological section at Gilbert's Pit at Charlton, for example, is not now exposed from the Chalk to the Blackheath Pebbles: after World War II the lower part of the pit, comprising the top of the chalk and at least a part of the Thanet Sand, was hidden by tipped rubble from bomb-damaged buildings.

The High Elms dene hole

The grilled top of the shaft of the High Elms dene hole at TQ 515771 can be seen in High Elms Country Park, London Borough of Bromley. This is, probably, a medieval chalk mine, consisting of a single deep narrow shaft sunk in Upper Chalk, with several small chambers mined laterally on a trefoil pattern from the bottom (the depth is not stated). Permission to descend the shaft by suitably equipped and experienced persons has to be obtained from LB Bromley. This is a known bat hibernation site, so the mine should not be descended during the winter months.

Chislehurst 'Caves' and Pinner Chalk Mine

Two paragraphs on page 60 are devoted to chalk mining in Greater London, the sites noted being those at Chislehurst (LB Bromley) and Pinner (LB Harrow) as well as a number of dene holes. Chislehurst 'Caves' (a touristically adapted chalk mine which has also seen use for World War I explosives storage, as a mushroom farm, and as a World War II air-raid shelter) are not rated as of high intrinsic geological importance, although of course by virtue of their extent (albeit less in fact than implied by tourist-orientated literature and guides) they do represent a significantly well-preserved site for economic geology. As all the mined galleries appear to have been driven in one bed of chalk, generally up to two to three metres thick, they make accessible only a small fraction of the total thickness of the Chalk formation, of the order of some hundreds of metres thick at Chislehurst. In places where the mine ceiling has failed, the accessible vertical stratigraphical section is extended upwards into the overlying Thanet Sand. The Chislehurst chalk mines (and presumably the neighbouring abandoned ones in Camden

Park) were driven into an inlier of Upper Chalk within the Lower London Tertiary beds outcrop. They exploited a few metres' thickness of chalk bounded above by Thanet Sand deposited on an erosional surface on the Chalk, and below by the local water table. The rather small river Quaggy runs nearby, and Chislehurst 'Caves' do flood from time to time. Archaeologically, much of interest remains, although most of the surviving archaeology reflects the mines' secondary uses rather than their (probably mostly eighteenth and early nineteenth century) primary mining phase. The site, archaeologically, is compromised by modern tourism, the use of the 'caves' for popular 'musical' events, and the use of a large section for 'Dungeons and Dragons' games. Significant parts of the system are 'off-limits' as a result of extensive roof-falls, probably caused by percolating acidic rainwater dissolving parts of the quite thin beds of chalk between the mine ceilings and the overlying sand. This zone is reflected by an area of undeveloped disturbed ground above a part of the 'caves'. The author of this abstract (PWS) recommended to the former English Heritage Monuments Protection Programme that, for well-preserved chalk mines *per se*, Pinner was to be preferred to Chislehurst, where the surviving archaeology is of greater value in terms of twentieth-century secondary uses.

SOURCE: GREATER LONDON AUTHORITY, 2008, *Consultation Draft: Geodiversity of London. The London Plan (Spatial Development Strategy for Greater London) Draft London Plan Implementation Report, July 2008*. Greater London Council: 168pp. Postscript: since the above was written, a finalised version of the discussion book has been published, the details being as follows:

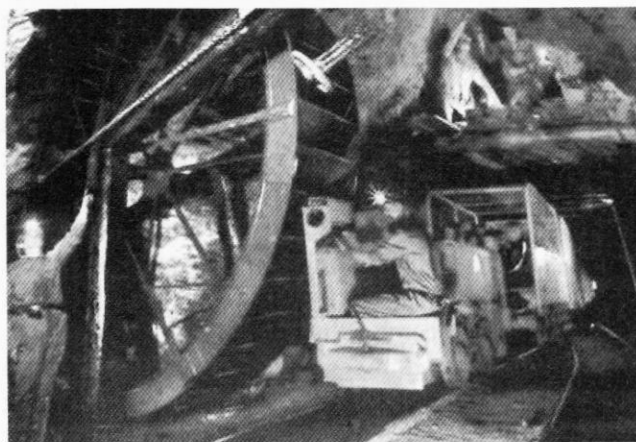
BARRON, H.F., J. BRAYSON, D.T. ALDISS, M.A. WOODS, and A.M. HARRISON, 2009, *London's foundations: protecting the geodiversity of the capital. The London Plan (Spatial Development Strategy for Greater London). London Plan Implementation Report*. London: Greater London Authority: 174pp. [ISBN 978-1-84781-250-6]

The Morwellham & Tamar Valley Trust goes into administration

Following a meeting with all major Morwellham stakeholders in Exeter on Tuesday 22 September 2009, it was agreed that The Morwellham and Tamar Valley Trust and its associated trading company, The Morwellham Trading Co. Limited, would go into administration. This step was taken following discussions between the Trust and Devon County Council and West Devon Borough Council, its principal creditors. All parties agreed that administration was the best course of action to protect this unique heritage asset and the significant amount of public funding already invested in the site and its surroundings. The administrators kept the centre open until the end of October, when it closed for winter

maintenance. There are likely to be some job losses but these will follow a review of the needs of the site and the seasonal closure programme. Although specific asset sales may be considered by the administrator, the administrators will seek a way to preserve as much of the site as possible. This will seek to ensure that the Trust's obligations to its stakeholders, including the Heritage Lottery Fund, the Tamar Valley AONB and the World Heritage Site for the Devon and Cornwall Mining Landscape are fulfilled. Administration with these goals in mind will also provide the opportunity to fulfil the original goals of the Morwellham and Tamar Valley Trust, which was founded in 1970 to conserve and enhance the natural beauty and amenity of the site for the benefit of the public. It is hoped to reopen for next year's season as the principal stakeholders notably West Devon Council will work with administrators Grant Thornton to ensure a viable future for this important world heritage site.

SOURCE: Morwellham Quay website
[www.morwellham.co.uk].



George and Charlotte Show Mine at Morwellham Quay

Bats underground

All species of bats found in Great Britain are legally protected. It is a criminal offence for any person, not having an appropriate licence issued (in England) by Natural England to search for bats underground, or in any way disturb or photograph bats underground. This is because the lives of those bats that hibernate underground (not all of them do) are put at risk if they are aroused from hibernation. In the autumn, having built up fat reserves to see them through the winter, these bats go into suspended animation (although, apart from the two species of horseshoe bats, not usually suspended from cave or mine ceilings: they generally prefer to wriggle into very narrow cracks in the wall). The stored reserves keep the animals ticking over, with greatly reduced pulse and respiration rates, until the following spring. If a hibernating bat is aroused during the winter, a process which once started the animal cannot reverse, a significant part of its fat reserves needed to survive the winter is used up. It may then use up more reserves flying about looking for scarce or non-existent insect food

on the wing. The end result is all too often a dead bat, with insufficient stored or fresh food to survive. So, if you happen upon a hibernating bat: Don't shine lights at it; Don't photograph it; Don't stand underneath it – warm air convection currents from your body can start the irreversible arousal process; Do just walk away and leave it alone. The Summer 2009 issue of *Bat News*, the magazine of the Bat Conservation Trust, contains several relevant articles, as follows: BAT CONSERVATION TRUST, 2009, A crime against nature. *Bat News* 89, page 8. Reports that in the last two years, successful prosecutions of persons damaging or disturbing bats, and levels of fines imposed, have increased significantly. These would relate to bats underground, but also of course to bats hibernating in buildings and in other contexts. PUCKETT, John, and Peter SCRIMSHAW, 2009, Investigating underground sites in Kent. *Bat News* 89, page 4. Reports the Kent Bat Group's 25 years of recording and monitoring bat hibernation sites in the county. The sites regularly checked include disused railway tunnels, old fortifications, chalk and ragstone mines, World War II bunkers, air-raid shelters, follies, and ice houses. Approximately 60 sites are checked in January and/or February each year by licensed specialists assisted by non-licensed volunteers. The species most often found are Daubenton's, Natterer's, brown long-eared, and occasional Brandt's / Whiskered bats. The highest numbers hibernating are in the ragstone mines at Hosey Common, near Westerham. Members of the Kent Underground Research Group and the Wealden Cave & Mine Society joined forces with the Kent Bat Group in surveying the several networks of tunnels here, opening up new ones, and making entrances secure to protect bats in the winter. Members of KURG and WCMS can borrow keys for access outside the hibernation season, approximately October to March. The Wealden Cave and Mine Society, which controls access to several east Surrey mines, has a policy of changing locks at the beginning and end of each hibernation season. Members may have keys to the 'summer' locks, but not to the winter ones. *Subterranea Britannica's aims and objectives, as set out in our Articles and Memorandum of Association, specifically require members to keep within the law, especially the relevant wildlife conservation legislation. Several of our members are also active members of the Bat Conservation Trust or of local bat groups, and assist licensed bat specialists in, for example, recording and counting bats hibernating underground.*

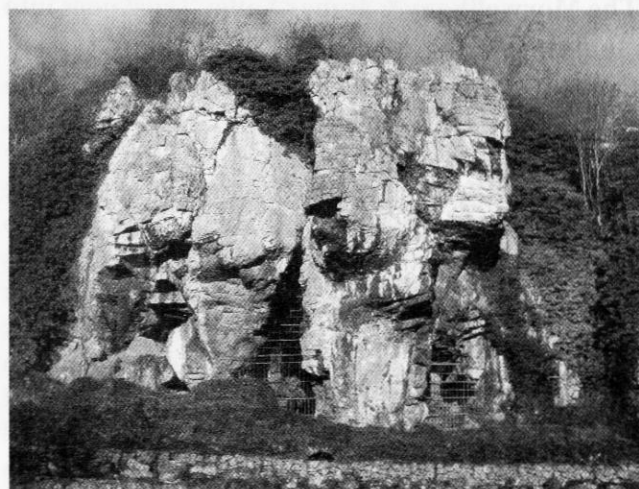
Disused London Underground stations proposed as tourist attractions, London

Ajit Chambers, a former investment banker, has proposed setting up an Old London Underground Company which would reuse 'dozens' of disused London Underground stations and adjoining disused tunnels (where these exist)

as tourist attractions. He also proposes to reopen around 40 disused air-raid shelters on or associated with the system for the same purpose. It is reported that Aldwych Station, and disused subsurface platforms at Charing Cross, are already used from time to time by film and/or television crews. Chambers proposes to adapt another 26 disused stations – including some, it seems, which are on closed surface lines. Boris Johnson, Mayor of London, has welcomed the plan as 'brilliant' but a Transport for London spokeswoman said, 'The cost of reopening the stations would be huge. We have no plans to reopen them.' SOURCE: TOBIN, Dominic, 2009, Former banker hopes to open disused stations. London tourism goes down the tube. *The London Paper*, 11 September 2009, page 10.

New museum at Creswell Crags, Derbyshire / Nottinghamshire

Creswell Crags, on the Derbyshire / Nottinghamshire borders near Worksop, contain a number of small natural caves containing important Ice Age archaeological remains. The importance of the site was enhanced on 14 April 2003 with the discovery of Britain's first Ice Age cave art by Paul Bahn, Paul Pettitt, Sergio Ripoli and Brian Chambers. This differs from the well-known prehistoric cave paintings of France and Spain, taking the form of drawings incised into rock faces rather than painted onto them. The attractive site, within a gorge between limestone cliffs, has been of recognised importance since nineteenth-century archaeological excavations within the caves. However, enjoyment of it has been marred over the years by the erection of a sewage works at one end of the gorge, and by traffic on the B 6042 road, which links the A60 to the A616. The road is now being relocated to a new alignment, allowing visitors to better enjoy both sides of the gorge and its stream. And a new on-site museum has been opened. All but one or two of the caves are very small and do not go beyond daylight. Access into the more impressive ones, in terms of size and of cave art, is by guided tour. SOURCE: ANON, 2009, Sir David Attenborough opens new museum at Creswell Crags. *Current Archaeology* 20(6)(234), page 6.



Purbeck Mineral and Mining Museum, Dorset

A museum of Isle of Purbeck ball-clay mining is in course of development at a former mine site at Norden, near the A351 road between Wareham and Corfe Castle. It is apparently being developed in association with the Swanage Railway Trust's preserved railway, itself in course of reopening in stages between Swanage and Wareham; this line was closed to passengers by British Railways in 1972. The last ball-clay mines in Purbeck had closed by 2000, although at least one large opencast pit was still operational when your reviewer [PWS] visited it in that year. The museum comprises a surface building, an artificial mine adit built on the surface using steel girders, corrugated iron, and timber, and the site features narrow-gauge railway effects.

SOURCE: Light, Barry, 2007, Purbeck Mineral and Mining Museum. *Sussex Railway Magazine*, Winter 2007, page 22.

Canterbury Roman Museum, Canterbury, Kent

The Roman Museum at Canterbury is in Butchery Lane, the narrow thoroughfare affording what is probably the best-known view of the Cathedral gate. Operated by the City, it lies below street level, and below a modern commercial development, and is centred on Roman mosaic pavements and a hypocaust preserved *in situ*. Alongside these are displayed some superb Roman-era finds from the city, all splendidly displayed and explained. For further information, visit

www.canterbury-museums.co.uk

NEWS – HEALTH AND SAFETY

Health and Safety notes – a near miss

Paul W. SOWAN

Many of us have, knowingly or not, had lucky escapes. Your scribe himself was just missed by a V2 rocket in 1944, and some years later by an IRA bomb at Reading! And, somehow, in my twenties I survived several years of solo mountaineering at 4,000 to 5,000 feet in the remote peaks and glaciers of north Iceland. Here is a tale from the Peak District concerning a shaft at Longcliffe mine near Castleton in Derbyshire, and its exploration by Peter Harrison and Trevor Ford when they were teenagers: We are lifelong friends, at least from 1937. I was living at the Speedwell Cavern in 1941 and Trevor cycled over from Sheffield to stay with us most weekends. Trevor was nearly 17 and I would be 15 years old. After finishing our days work guiding and pushing the boat in the Speedwell we did a bit of potholing, sometimes in the Speedwell and sometimes elsewhere. One Saturday evening in the summer of 1941 we came across an open shaft on Longcliffe Side, we threw 2 or 3 stones down and it appeared quite deep. Trevor said, "We need a rope ladder, I'll get one from Mudfords and bring it over next Saturday." Speedwell mine, near Castleton, is partly a lead mine and partly natural caverns broken into by the miners, amounting to about six kilometres of

passageways. Underground links to the Peak Cavern make for a total of over 16 kilometres. Of this, about two kilometres are accounted for by underground canal tunnels, the first of which can be traversed by tourists who are ferried in about 450 metres in a boat. There is a good description with plans and photographs (many by Paul Deakin) in Trevor Ford's book *Castleton Caves* (Landmark Publishing, 2008). Trevor arrived the following Saturday with 50 feet of rope ladder fastened to the back of his bike. It was the original kind of ladder, made of rope with oak rungs and it was quite heavy. About 8.00 pm that evening we set off to the mine shaft, Trevor carrying the ladder and me a stout oak beam. Arriving at the shaft, we threaded the beam through one end of the ladder then lowered the other end down the shaft to its full extent. Down went Trevor (without a safety line) in a few minutes he was back on the surface again, saying, "It's not long enough, I'll get another length for next Saturday." The following Saturday the same procedure but with a 100 feet of ladder down the shaft. Down went Trevor and in a few minutes he shouted up to me, "The ladder's not touching the bottom but I think I can see it. I'm going to jump off." "Don't risk it," I shouted back, "get some more ladder next week and a safety line." Next Saturday exactly the same but with 150 feet of ladder down the hole. Again Trevor descended, this time with a safety rope. He found the end of the ladder was within a few feet of the shaft bottom and he was able to drop off safely. After having nearly an hour down below Trevor reappeared and said "It's a long way down." I said, "It's a good thing you didn't jump off last Saturday, it would have been a 60 foot jump!"

SOURCE: HARRISON, Peter C., 2009, Letter [re. early exploration of a deep shaft at Longcliffe Side by the author and Trevor Ford] *Newsletter Peak District Mines Historical Society* 131, page 8.

NEWS – MILITARY AND DEFENCE

World's first civilian air-raid shelter, Cleethorpes, Lincolnshire

The world's first civilian air-raid shelter was built during World War I, it has been claimed, at Cleethorpes, at the mouth of the Humber near Grimsby, Lincolnshire. It is said to have been built by a local resident after a Zeppelin raid on 31 March 1916. There is no public access.

SOURCE: WRIGHT, Neil (ed.), 2004, *Lincolnshire's industrial heritage – a guide*. Lincoln: Society for Lincolnshire History and Archaeology: 106pp [ISBN 0-903582-20-1]

Winston Churchill and his Cabinet War Rooms, Westminster

A September 1940 internal Government letter concerning the Westminster Cabinet War Rooms, sent by Patrick Duff, who was at the time a permanent secretary at the Office of Works, to the Cabinet Secretary of the day (Sir Edward Bridges) has recently been released into

the public domain. Duff had just had an uncomfortable interview (on 13 September) with the wartime Prime Minister, Winston Churchill, who had felt himself to be misinformed about the ability of the War Rooms to survive enemy attack. The hapless permanent secretary wrote ‘with some emphasis’ that he had been at pains ‘literally for years past, when this place was originally taken for a War Room and on every occasion since, when fresh essential personnel were put down there and required further accommodation, to represent that the place is not, and cannot be made, bomb-proof in any sense.’ The consensus of informed opinion is that a direct hit by a German high-explosive bomb, never mind a V1 or V2 weapon, would have turned the War Rooms into ‘a tomb of Portland stone and concrete’. The War Rooms had initially been constructed as a temporary refuge but, perhaps because Churchill evidently without much advice or thought, declared that he would remain in and direct the war from Westminster, they remained in use for the whole six years of World War II. The Rooms are now open to the public almost every day, and the letter has been on display there amongst much else of wartime interest since 27 August 2009, the seventieth anniversary of the centre becoming operational, a week before Britain declared war. Although Churchill clearly appreciated the vulnerability of his lair in September 1940 (Whitehall had its fair share of enemy high-explosives), he is known to have made almost no use of his alternative War Rooms (codenamed Paddock) at Dollis Hill, in NW London.

SOURCE: Maev KENNEDY, 2009, ‘Scream of innocence’ cries out from Churchill’s wartime bunker. *The Guardian*, 20 July 2009, page 13.

Mill Hill bunker – house conversion completed

Conversion of a 1950s nuclear bunker in Partingdale Lane, Mill Hill in north London into a luxury home has been completed. The building was originally one of the four London group controls (regional war rooms). It covered the North Group (Barnet, Camden, City of London, Enfield, Haringey, Islington, Westminster). It became disused in 1958 and remained so. Although it was designated for use by Barnet as their emergency control, they never actually used it. The Architects have struggled for years to get planning permission for the Grade II-listed concrete structure as the Mill Hill Preservation Society objected to the Cold War relic becoming a private residential property. The 921m² family home – which has 1.5m thick walls on the ground floor – is set in 1.5 acres of landscaped grounds in the Mill Hill Green Belt. The highly glazed, open-plan first floor allows panoramic views of the neighbouring fields. SOURCE: *Architects Journal* 4 September 2009

[Editor’s Note: the property has been advertised by a local estate agent for £7 million.]



Completed Mill Hill bunker conversion

Soviet tank invasion map for Manchester

Christopher Perkins, a geography lecturer at the University of Manchester, has organised an exhibition of maps of the city at the John Rylands Library in connection with the Royal Geographical Society’s 2009 annual conference held there. Amongst the items on display is a 1974 USSR map indicating preferred route for invasion by tanks, reminiscent of the Soviets’ invasion of Prague six years earlier. The invasion map ignores one-way streets and known locations for rush-hour traffic jams. But the preferred invasion routes, highlighted in orange, take account of road widths and load-bearing statistics, and by-passes awkward bends. Key objectives are colour-coded: administrative buildings are purple, industrial sites black, and military installations green. The printed map, with place-names in Cyrillic characters, is evidently based on published street atlases and Ordnance Survey maps, supplemented by satellite photography and perhaps also observation on the ground. Details for sites such as Strangeways prison, not published by the Ordnance Survey, are included. A colour-printed extract reproduced in *The Guardian* indicates it is from a sheet covering Manchester, Bolton, Stockport and Oldham (all of course printed in Cyrillic characters); it appears to have been printed at a scale of about 1:100,000.

SOURCE: Martin WAINWRIGHT, 2009, Cold War: tank tracks to Trafford: how USSR planned to invade Manchester. *The Guardian*, 26 August 2009, page 11.

The firing of V2 rockets from Den Haag, The Netherlands

Nazi Germany’s ‘retaliation’ (*Vergeltung*) weapons, the V1 and the V2, were aimed at UK targets, and some such as Antwerp in liberated Europe, in the last years of World War II. The V1 was a ‘flying bomb’ with a range of about 150 miles, while the V2 was a supersonic rocket with a range of about 200 miles. Launching sites were, necessarily, in occupied Belgium, France and the Netherlands, not in Germany. J.R. Verbeek’s historical study of the V2 deals with the launching of more than a thousand V2 rockets from Den Haag and its environs between 8 September 1944 and 27 March 1945. Twelve of these misfired and fell back on the city, killing more than 60 people. The main intended targets were London

and (liberated) Antwerp. Technicalities of the Dutch launching sites are considered, as are the effects of Allied bombing attacks on these sites and associated strategic infrastructure such as railway installations. There is further detail on the technicalities of the rockets themselves, and of their manufacture in the underground factory (Geheimprojekt Mittelbau) near Nordhausen in eastern Germany and its associated concentration camp DORA.

SOURCE: VERBEEK, J.R., 2005, 'V2 – Vergeltung' from *The Hague and its environs. Deployment of the V2 rockets and the terrors for the City and her inhabitants. Historical background.* Almeer-Den Haag: V2 Platform Foundation: 64pp. [First English edition of a Dutch title published in 2003.]

Old bunkers get new life as flats in Bremen

Bremen-based architect Rainer Mielke has made a career out of transforming old bunkers into modern, affordable apartments. Out of these dilapidated buildings, Mielke and his partner Klaus Freudenberg create unexpectedly airy spaces that marry the old with the new. Fifteen years ago, Rainer Mielke cycled past a bunker on his way to work each day. Grey and covered in lichen, the World War II building stood in an expensive Bremen area where the architect and his wife wanted to buy real estate. Mielke decided he would try and transform this bunker into a flat. While it took many years of wrangling with bureaucracy before Mielke could make this idea a reality, the 52-year-old managed to turn several other bunkers into housing in the meantime. Internal renovation of the bunker was prohibited due to a so-called 'civil protection commitment' to keep the building free in case of an emergency requiring people to use it for protection again. Even Mielke's idea to use just the roof of the bunkers as foundations was refused by city authorities. All the flats use the upper levels and roof of the bunkers for apartments, with subterranean parking garages for residents' cars. Mielke's proposals ensured the original structure would remain unaltered while the new extensions should use colour to accentuate the old. Once the minister for internal affairs lifted the civil protection order on the bunker that fuelled the original idea, Mielke immediately began turning the upper floor of the bunker into a flat. He cut chunks out of the walls to make windows. After a few months of renovation work, Mielke's sister moved into a light-flooded apartment. Now, whenever a potential buyer contacts Mielke, he uses it as a showcase flat. Some 2,000 bunkers still stand in Germany, and Mielke's project could become an integral part of reusing the concrete structures.

SOURCE: *The Local - Germany's News in English* 31 August 2009



Completed Bremen bunker conversion

NEWS – MINES AND MINING

Proposed exploitation of coal reserves below the Firth of Forth, Scotland

Two hundred square miles of unexploited coal seams lie over 500 feet below the Firth or Forth. Traditional mining of this reserve is not in current times cost-effective, and there are now environmental objections to using the combustion of fossil fuels as a source of energy in conventional power stations. A proposal has been made for the exploitation of this coal using a combination of underground gasification and fuel cell technology. This would call for the injection of oxygen and water into the seams to release hydrogen and carbon dioxide deep underground. Fuel cells would generate electricity from the hydrogen and oxygen, and the carbon dioxide released would be captured at source and stored – perhaps also underground. Electricity generation here by 2012 has been described as feasible.

SOURCE: SMITH, Lewis, 2009, Coal 'flash-fried' underground can provide a green source of energy. *Daily Telegraph*, 4 August 2009.

Peak District Mines Historical Society website developments

The Peak District Mines Historical Society has announced that its website www.pdmhs.com has been updated. There is a new section on Peak District mining laws and customs, with links to George Hopkinson's 1644 treatise on the mining laws of Wirksworth Wapentake, the High Peak Mining Customs and Mineral Courts Act 1851, and a transcript of a legal case in 1897 in which Arthur Stokes (HM Inspector of Mines for the Midlands District) took a Mr Arkwright to court over unsecured shafts on his land near Cromford, Derbyshire. There is also a link to an interactive search engine that allows the user to search, via keyword, fifteen volumes of the Society's *Bulletin* (now called *Mining History*) and also the *Transactions*, *Memoirs* and *Monographs* of the Northern Mine

Research Society and its predecessor Northern Cavern and Mine Research Society.

SOURCE: ADLAM-STILES, Niki, 2009, Silence Mine: the story so far. *Newsletter Peak District Mines Historical Soc.* 132 (October 2009), page 5.

AditNow

Members interested in mining who have not already found it may like to visit www.aditnow.co.uk, a website devoted to UK mine and quarry exploration. It features a discussion forum, and a searchable database of UK mines and quarries. It claims 'tens of thousands' of indexed mines and quarries, photographs, and documents. Users are invited to add to it. A 2010 mine exploration calendar is now available, featuring mining scenes, and sold on behalf of charities. For information visit <http://www.aditnow.co.uk/static/calendar/htm> There is also a 'coffee-table' book *Underground Reflections* – visit <http://www.aditnow.co.uk/static/book.htm> And for photographers, you may wish to consider entering your work for the 2009 photo competition – visit <http://www.aditnow.co.uk/static/competition.htm>

Harworth Coal Mine, near Doncaster, South Yorkshire

Speculation is reported that, as a result of currently high coal prices, UK Coal is set to announce recommencement of production at Harworth Mine near Doncaster, South Yorkshire, which has been mothballed for several years. UK Coal is the UK's largest producer of deep-mined coal. The company currently operates deep mines. Coal prices have risen by almost 100% in the last year.

SOURCE: ANON, 2009, Is UK Coal going to reopen Harworth Mine? *Down to Earth* 68, page 4.

Aberpergwm and Treforgan Coal Mines to triple anthracite production, South Wales

Energybuild owns two former British Coal deep mines in South Wales. Aberpergwm colliery is in the Neath Valley, and Treforgan in the Dulais Valley. Production has restarted at Aberpergwm for the first time since 1985. The company proposes to sell more coal to the nearby Aberthaw Power Station. The Corus steel plant at Port Talbot is another potential customer. Both concerns are at present using imported coal.

SOURCE: ANON, 2009, Meanwhile in South Wales Energybuild aims to triple anthracite production by 2011. *Down to Earth* 68, 4 - 6.

Gwynfynydd (or Gwynfynnydd) gold mine abandoned, and speculation concerning reopening of Clogau gold mine, Wales

The Gwynfynydd (or Gwynfynnydd) gold mine was developed as a tourist attraction during the 1980s, whilst still producing gold (evidently not enough to cover the running costs), but has now been abandoned. It has been left to nature and, possibly, vandalism. The mine (for which two different spellings are cited in the source for

this report) is said to have been on the banks of the Mawddach, which seems to place it somewhere to the north of Dolgellau in mid-Wales. A July 2009 visit report notes a collapsing engine shed, and a visitor centre containing the remains of postcards, souvenirs, brochures, and the remains of a perspex three-dimensional mine plan. The main adit is secure, but the heavy steel gate to the former visitors' route lies on the ground. A notice warns passers-by not to enter, and it reportedly 'looked dangerous'. The site has recently been purchased by a development company which has plans to build 50 'ecolodges' there. Meanwhile, Clogau at Bontddu in Snowdonia, North Wales, was Wales' largest gold mine until it closed in 1998. Clogau Gold of Wales Ltd has reportedly stockpiled enough Welsh gold to continue making jewellery for some tens of years, but strong demand has reduced the estimated life of the reserve of mined gold to seven years. There seems to be a distinct possibility that this mine might be reopened and put back into work.

SOURCE: CALLENDER, R.M., 2009, The end is nigh! *Newsletter NMRS*, August 2009, page 7. SOURCE: ANON, 2009, Could there be a future for gold mining in Wales? *Down to Earth* 68, page 6.



Gwynfynydd mine adit

NEWS – MISCELLANEOUS

Alan Arthur Jackson [1922 – 2009]

Alan Jackson, one of Britain's leading and best railway historians, died on 21 February 2009. Anybody seriously interested in London's railways, including the underground railways, will have read his several published books, and many of the shorter notes and articles he contributed to various magazines and journals. Some of those particularly relevant to underground railways are listed below. Alan Jackson, who lived in Dorking, was born in Tottenham on 12 July 1922. Both his father and his grandfather worked for the Railway Clearing House, although Alan himself was a civil servant. He served as President of the Railway and Canal Historical Society in 1988–1990. In retirement, he worked one day a week in

the local history museum in Dorking. The author of this short note [PWS] enjoyed a two-way correspondence and exchange of information about railways in Surrey with him in the last few years, and occasional conversations at Dorking Museum. An obituary was published in the *Journal of the Railway and Canal Historical Society* 36(5)(205), page 111 (July 2009).

Proposal to turn 750,000 Albanian bunkers into hostels and other tourist sites

Politecnico di Milano graduate students Gylar Mydyti and Elian Stefa have devised a 105-page proposal to transform some 750,000 bunkers scattered throughout Albania into a network of beautifully-adorned hostels, cafés, gift shops and other tourist-attracting sites. The domed bunkers, called Pillboxes because of their shape, were built by Communist dictator Enver Hoxha, who ruled the country from the end of World War II until his death in 1985. According to the students' website, Hoxha was extremely xenophobic and paranoid about an invasion, and so he built the bunkers to protect the people. Of course, the invasion never came and the bunkers, which were built at enormous expense, remain haunting symbols of the country's Cold War isolation. Today, there is one bunker for every four Albanian! The students, who call these structures "Concrete Mushrooms," say the project would not only transform the empty bunkers into economic assets, but also reclaim them symbolically. On their website, the students write that the bunkers "can become the icon of a paranoid past transformed to the symbol of a bright future." The proposal suggests



Inside one of the refurbished Albanian bunkers.

different functions be assigned to the bunkers based on their size and location. Apparently, there are three major sizes scattered across three different types of territories, including beautiful hilly plains, mountainsides and even along gorgeous, sunny beaches. On the site inhabitat.com, blogger Daniel Flahiff compares the project to the Das

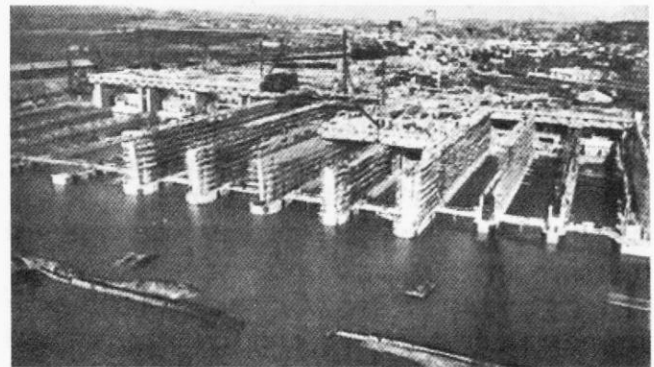
Parkhotel, hotel rooms made from giant abandoned sewage pipes in Linz, Austria. A documentary on the history of the bunkers, their current status and their impact on the residents of Albania is set to be released in January 2010.

SOURCE: Tonic website 28.10.2009

Submarine bunker in France turned into venue for modern art

A 40,000-square-metre German submarine bunker from World War II has become one of the most visited art spots in Bordeaux. For nearly ten years jazz concerts have been held in the steel and concrete structure with its numerous boat chambers, as have dance festivals. The current art exhibit Evento, the first free biannual festival for contemporary art, is another step in elevating Bordeaux, which recently has undergone a rehabilitation, to the status of a cultural city. The entrance to the Nazi-era submarine bunker looks like a monstrous animal opening its mouth as if to gobble up the visitor in its gigantic interior made of 600,000 cubic metres of concrete forming eleven wet bays. It is a gigantic, eerie and at the same time fascinating place that poses a challenge to every artist. Not everyone is as successful in utilising the indestructible bunker as Israeli film-maker Amos Gitai. As part of the Evento exhibit he projected excerpts from his films onto the thick concrete walls that reflect peculiarly in the water of the submarine chambers. The submarine bunker is also a cultural attraction for dance and jazz festivals. Both kinds of events attract people to the concrete structure in droves. The submarine bunker was built between 1941 and 1943 by about 2,500 prisoners of war. Its size is its most impressive feature, but the city wants to change that. The buildings that border it, which served as administration buildings for the Germans, are now artists' residences. In the long term a new city section is expected to be built around the bunker.

SOURCE: *Earth Times* 29.10.2009



Bordeaux U-Boat pens under construction in 1942

From Circle Line to Mug-handle Line on the London Underground

London Underground's Circle Line has had, historically, no terminus and no depot on the line. Its trains have, for decades, trundled around, half of them clockwise, the other half anti-clockwise. Nor has it had, save a few connecting spurs, the exclusive use of track of its own.

Most of its route has been shared with the District and Metropolitan lines. And it has been possible to travel round and round all day, in either direction, without changing trains: how many of the homeless found this a warm home for the day in the winter months? All this is expected to change from 13 December 2009. Circle and Hammersmith & City services are to be combined, running back and forth between Hammersmith via Edgware Road, Liverpool Street and Victoria to Edgware Road and back again. So outbound trains from Hammersmith will pass through Edgware Road, go all round the circle, and terminate at Edgware Road! And then follow the same route back to Hammersmith. This has raised an interesting question. What destinations are to be shown on the fronts of the trains? An eastbound train from Hammersmith might be shown as terminating at Edgware Road, which it will indeed do, having already passed through Edgware Road on its way around the circle! Those unfamiliar with the London Underground could pass through Edgware Road without noticing, and ultimately arrive there many stations later! And what about passengers for, say, Ladbroke Grove boarding a train at Bayswater? Might they board a train showing Hammersmith as its destination and, instead of changing at Paddington, go almost all the way round the Circle anti-clockwise via Liverpool Street? Presumably London Underground will issue a new LU map, making it clear how 'Circle' line trains will in fact shuttle back and forth between Hammersmith and Edgware Road, via Edgware Road!

SOURCE: VOTE, Richard, and Martin STONE, 2009, Circle Line. *Modern Railways*. [Two letters commenting on the new arrangements.]

House extensions underground, London

Owners of expensive properties in London, wishing to have more space, are now extending their houses downwards. The creation of up to three levels of subsurface basements is increasingly seen as more cost-effective than moving to a larger property elsewhere. The Royal Borough of Kensington and Chelsea approved over six hundred such schemes in just over two years. In May 2009 the London Basement Company had over 35 contracts in progress. The additional subterranean spaces have included wine cellars, gymnasias, home cinemas, and swimming pools.

SOURCE: KIRWAN-TAYLOR, Helen, 2009, Under construction: why move house, when you can dig down and create an underground wonderland beneath the pavement? *Evening Standard Magazine*, 29 May 2009, 22 – 23.

So how did the cackling auditions go at Wookey Hole, Somerset?

The proprietors of Wookey Hole, the well-known showcave in the Mendip Hills, near Wells, have advertised for a witch to meet and greet visitors. The ability to cackle

satisfactorily, it was reported, would be tested at auditions on 28 July 2009. The stated remuneration is £50,000 per annum 'pro-rata', but presumably this means the full-time equivalent rate of whatever the proprietors will pay per hour on duty. As the witch will be required only 'at weekends, school holidays, and special occasions' the actual take-home pay looks like being less than spectacular. A subsequent issue of the same newspaper announced the appointment of a 50-year-old estate agent, Carole Bohanan, from Shepton Mallet, to be known in her new role as Carla Calamity. The *Daily Telegraph* of 25 July reported there to have been 2,319 applicants. SOURCE: MANGAN, Lucy, 2009, Wookey Hole wants to hire a witch. *The Guardian* G2, 9 July 2009, 2 – 3; and *The Guardian*, 29 July 2009, page 4.

Ordnance Survey 25-inch plans (1855–1882) for Scotland on the Web

It has been announced that the National Library of Scotland has placed its 25-inches-to-the-mile plans for Scotland on the Internet. These are the first-edition plans at this scale, made in the years 1855-1882. The website is www.nls.uk/maps/os/25inch/. Hopefully, information printed in the margins appears, as well as the plans themselves. The marginal information gives, apart from Sheetlines reference codes, dates of survey (historically crucial), dates of publication, etc.

SOURCE: FLEET, Chris, 2009, New website for OS 25-inch mapping of Scotland (1855 – 1882). *Sheetlines* 85, 11 – 12.

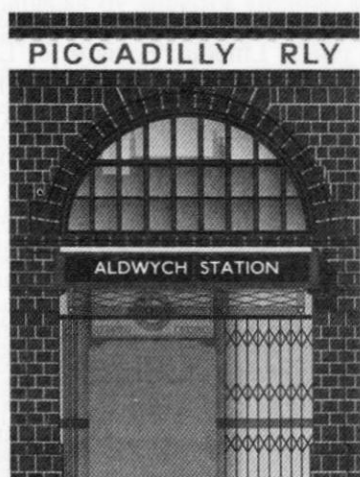
An underground station never built, Croydon Airport, Greater London

In 1925 the German airline Lufthansa proposed an underground railway station (Untergrundbahnhof) at Croydon Airport. A drawing from the airline's archives has been published credited to Junkers-Luftverkehr AG, with the title Flugplatz Croydon b. / London Projekt 1925. Whereabouts in London the line this might have served was to have originated is not clear, although a short spur partially in tunnel from the surface West Croydon to Epsom line, branching off a little beyond Waddon Station, seems most probable. Interestingly, the drawing seems to imply a southward extension to Purley, a route that would have implied a very steep gradient! Croydon Airport was developed from 1920 as the customs airport for London, from two adjoining World War I RAF airfields. In August 1921 it was announced as 'London's new land port at Croydon'. The terminal building and adjoining Airport Hotel, still standing, were opened in 1928. The last commercial flight departed from Croydon on 30 September 1959.

SOURCE: YEA, Hugh, 1990, Croydon Airport Underground Station. *Newsletter Croydon Airport Society* 43/90, 2 – 3.



NEWS – PUBLICATIONS (BOOKS)



THE ALDWYCH BRANCH

Antony Badsey-Ellis and Mike Horne

The Aldwych Branch

BADSEY-ELLIS, Antony, and Mike HORNE, 2009, *The Aldwych branch*. Harrow: Capital Transport Publishing: 112pp [ISBN 978-1-85414-321-1] £19.95. This exceptionally well-presented hardback book describes London Underground's now-closed Aldwych branch line, less than a quarter of a mile long, from Holborn to Aldwych, from its initial planning to its post-closure uses. The line was built with two tunnels, and with two tunnelled station platforms, only one of each of which was used for any significant length of time for fare-paying passengers. The terminus at Aldwych was equipped with three lift-shafts, each 23 feet in diameter and designed to accommodate two lifts: only the westernmost shaft was ever equipped with lifts. There was (and still is, of course) also an 18-foot-diameter shaft, 76 feet six inches deep, to accommodate a spiral staircase for emergency use (this now being the only means of access from street level to the platforms). Despite several plans, the branch was never extended southwards to provide an interchange with the District and Circle Lines at Temple Station, a mere 150 yards or so away. Even many of the published London Underground maps failed to alert passengers that these two stations were so close together. And of course an envisaged extension under the Thames to connect with other lines at Waterloo never happened. At the north end of the branch provision was made for running through trains from Aldwych northwards to and beyond King's Cross. Very few trains in service ever used the connection, although of course it was used to move branch line trains to and from the Piccadilly Line's depot. Disused and never-used parts of the station's and running-line tunnels, and associated space at Holborn, were used in both World Wars for secure storage by national art galleries and museums. Public air-raid shelters, administered by Westminster City Council, were provided at Aldwych, which closed for traffic during World War II. And, again at the Holborn end of the branch, two

escalators were 'lent' to the Government for its top-secret Government 'bunker' at Corsham (Wiltshire) where, it is assumed, they still are! The Aldwych branch is an intriguing line which operated between 1907 and 1994. It is said to earn more from its post-closure uses, by film and television companies amongst others, than it did from selling tickets to passengers! A most interesting and informative book, very well illustrated, but it has to come under the heading of expensive railway history, at a price equivalent to getting on for £80 a mile!

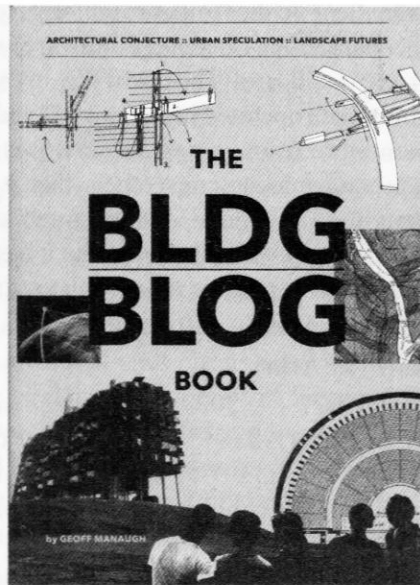
London Railway Atlas

BROWN, Joe [1977 -], 2009, *London railway atlas*. 2nd edn. Hershaw: Ian Allan Publishing: (5) + 62 + (33) pp [ISBN 978-0-7110-3397-0] £16.99. This is an A4 format hardback book containing 62 pages of colour-printed maps shewing all currently operational rail lines (including for example Croydon Tramlink) in the Greater London area with, sensibly, a few extensions so that for example the Caterham line is shown complete to its terminus. The Greater London boundary, oddly, is not shown. Closed lines are shown as 'ghosts' in lighter colours. Lines, and station names, are shown with dates of opening and (where applicable) closing. There is far less detail than in the 'Railway Track Diagrams' series, although for some users this may be seen as an advantage making for uncluttered clarity. Tunnel names vary in some cases from previous usage: presumably Croydon Tramlink refers to its three tunnels as the Sandilands Tunnels, whereas previously they have been called (from south to north) the Coombe Lane, Park Hill, and Woodside tunnels. Unlike Cobb's monumental atlas, Woodside tunnel is shown in its correct position. There are enlarged detail maps for complex and major stations and yards. The annotated index runs to 33 pages. Company names abbreviations, and company mergers and so forth are also listed. This is a useful atlas for those wanting uncluttered maps of London lines, along with basic historical information, without the geographical distortion characteristic of the Railway Track Diagrams version. And as this atlas concerns only London, and not the whole of southeast England as does the RTD version, the scale is larger and the layout less cluttered.

The BLDG BLOG book

MANAUGH, Geoff, 2009, *The BLDG BLOG book: architectural conjecture : urban speculation : landscape futures*. San Francisco: Chronicle Books LLC: 272pp [ISBN 978-0-8118-6644-6] \$29.95. This book's sub-title sums up its contents. Chapter 2 (pages 50-115) is headed 'The Underground'. This includes a wide-ranging mix of facts and speculations concerning what is known to exist, or what might exist, below places as far apart as London, Toronto, Cappadocia, Afghanistan, and so forth. There is more than a hint of 'urban exploration' about it, and perhaps a dash of conspiracy theory. I am reminded of the search





for non-existent subterranean chemical warfare factories in Iraq, or the entirely fanciful newspaper stories and even detailed drawings of supposed ultra-modern tunnelled Taliban military complexes in Afghanistan. Nevertheless, this is a stimulating read, with some nice photographs. Amongst the acknowledgements and recommended further reading there are listed Nick Catford, *et al.*, and the Subterranea Britannica website.

Royal silver mines of the Tamar Valley, Devon

RIPPON, Stephen, Peter F. CLAUGHTON, and Chris SMART, 2009, *Mining in a medieval landscape: the royal silver mines of the Tamar valley*. Exeter: University of Exeter Press: xiii + 207pp [ISBN 978-0-85989-828-7 (pb)]

This book deals with the late medieval Royal lead-silver mines at Bere Ferrers, and with the small town of Bere Alston, claimed to be ‘probably the first purpose-built mining town in Britain.’ Both places lie on the eastern (Devon) side of the Tamar, between that river and the smaller river Tavy. The Bere Ferrers mines employed up to 400 men in the area, ‘mining on a scale and at depths not previously possible’ and ‘changed forever the way that mining was carried out in medieval Britain’. This was made possible by the construction of such works as a ten-mile-long water supply leat for powering the pumps that freed the mines of water. Due attention is given to evidence for mine development, mining methods, ore preparation, and smelting. Silver, which occurred in the lead sulphide (galena) ore, was recovered by cupellation in which (the ore having been reduced to metal), the lead content is re-oxidised to litharge (lead oxide) leaving a residue of pure silver. The management of water, as a source of power, and woodland (for fuel) is considered in the light of extant field remains. At least one section of a leat was partially in tunnel. The text is based on archival sources and surface field survey, with copious references to primary sources.

Lincolnshire’s industrial heritage – a guide

WRIGHT, Neil (edr), 2004, *Lincolnshire’s industrial heritage - a guide*. Lincoln: Society for Lincolnshire History and Archaeology: 106pp [ISBN 0-903582-20-1] Members of the Association for Industrial Archaeology have recently received copies of Neil Wright’s guide to the industrial archaeology of Lincolnshire, in recognition of the fact that the 2009 AIA conference was based in the county. It is usual for the AIA itself to sponsor and publish such a guide for each of its annual conference venues. However, on this occasion an eminently suitable guide, published in 2004, already existed, so serves. As much of Lincolnshire is rather low-lying if not waterlogged, it is possibly a little short of underground sites.

Belgium underground: a fabulous world below our feet

STEVENS, Luc (ed.), 2005, *La Belgique souterraine: un monde fabuleux sous nos pieds*. Lovreval: Éditions Labor: 253pp [ISBN 2-8040-2117-3] [Euro 30.] This is a generously proportioned (22 x 30 cm) hardback book of colour photographs offering an overview of subterranean Belgium, with supporting text, maps, and diagrams. The sites portrayed and described include natural caves; biospeleology; mines and underground quarries; underground military works; wells, water-tunnels and sewers; tunnels; ice-houses; and miscellaneous *souterrains*. As a result, largely, of Belgium’s geology the majority of the sites are in the Walloon or French-speaking part of the country. However, Flemish Belgium does also feature, as there are important and impressive underground building-stone quarries in the Maastrichtian limestone on (and beyond) the Dutch border near Maastricht in the Netherlands; and, of course, Fort Eben-Emael in the same area, as well as the surface remains of some coal mines. The book concludes with a bibliography, a glossary of terms, and a ‘practical guide’ giving contact details for further information on and access to sites. [Luc Stevens is the president of SFES, our sister organisation in France.]

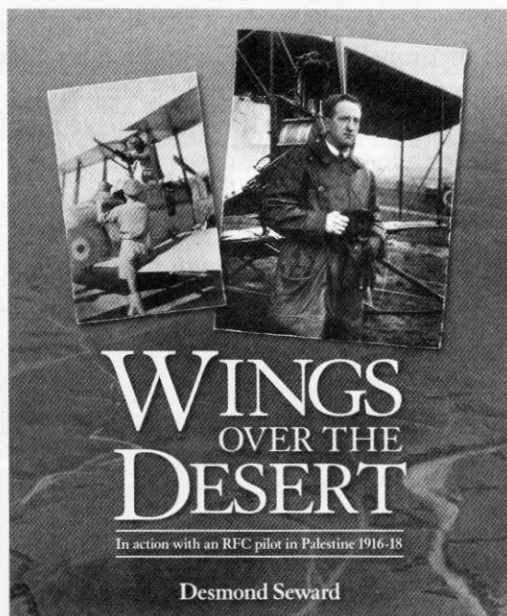
Wings Over The Desert

Reviewed by Julian Allason

SEWARD, Desmond, Haynes Publishing 2009. Hardback £19.99. [ISBN 978 1 84425 672 3] World War 1 Bunker-Busting from the Air

Lawrence of Arabia deliberately played down the Royal Flying Corps’ contribution to his desert campaign against the Turks in the Great War. Even less has been written about their role in rendering trench warfare obsolete. ‘Wings over the Desert’, a fascinating new book by that most readable of historians, Desmond Seward, rectifies this in spades. Precariously protected by fighter aces in flimsy scout planes, 14 Squadron’s slow wood, wire and canvas aircraft photographed the ingenious trench and subterranean defence systems excavated by the Turkish forces. In so doing they braved

anti-aircraft fire and their own unreliable machines, not to mention attacks by superior German planes. What makes this new book so gripping is that the author has inherited a hitherto unseen trove of letters and photographs from his father, the flying hero Eric Seward, famed for the Seward Exploit, a painting of which hangs in the Imperial War Museum. Escorting a BE2C photographing enemy fortifications at 8500 feet over Ramleh near Jaffa (now Tel Aviv), his Jumbo Martinsyde was hit by anti-aircraft fire. The choice was grim: crash-land in the desert and risk being castrated by Bedouin (if the machine did not burst into flames first) or ditch in the Mediterranean. Seward chose the latter, and managed to swim out to sea to escape fire from Turkish cavalry.



A former Olympic swimmer, he then floated, swam and walked – evading three Turkish patrols – over thirty miles back to British lines to make his intelligence report, earning a DSO for his courage. The inspiration for Capt. W E Johns’ Biggles character perhaps? Surprisingly little has hitherto been published about the Royal Flying Corps’ success in the desert campaign of 1916-18 let alone their effectiveness against bunkers. ‘Wings over the Desert’ brings alive such vivid characters as Eric Seward, a bruiser whose idea of fun was kicking a table over to start an argument, and the evasive T.E. Lawrence, whom he knew well and ferried around the desert in a two-seater BE2C. Indeed Seward, an Arabic speaker, was nominated to head the flight detailed to support Lawrence’s Arab Revolt, though he declined on the grounds that he could not see where it would lead, a fair assessment of what was in military terms “a sideshow to a sideshow”. Lawrence often dined in the 14 Squadron mess where they noted that, like a Bedouin, he did not trouble to brush the flies off his hands. He had spied on the German fliers’ mess, they believed, disguised as a waiter. Seward considered him a hero but, “he looked the most insignificant little fellow you ever saw, but always very pleasant”. In the ancient city of Gaza the Turks,

under a German commander, had excavated by hand an ingenious network of tunnels linking trenches, underground storerooms and gun emplacements. Despite numerical superiority, British attempts to overcome them failed in both the first and second battles of Gaza, partly for lack of accurate intelligence. The appointment of General Allenby, known as ‘The Bull’ for his temper, saw an improvement in air intelligence gathering and processing that made possible a much more aggressive campaign. RFC aircraft managed to photograph – no easy business using plate cameras clamped to the fuselage of an open plane – the entirety of Palestine, enabling large-scale maps to be produced. Pilots and observers, who both flew without parachutes, became so adept at this that even underground fortifications were detected and photographed, sometimes at close range. Hidden sites were discovered by following well-worn paths through the desert. When enemy movements were detected warnings were radioed in morse code direct to British artillery. The eventual result was the destruction of three Turkish armies.

This book manages to be both an entertaining read, even for non-aviation fans (like the reviewer) as well as a valuable contribution to the history of the Great War, with something for those with subterranean interests. Meticulously researched and profusely illustrated with contemporary photographs previously unseen, the book is full of vivid characters engaged in improbably gallant exploits against better equipped but equally chivalrous German pilots. It includes anecdotes that make the hairs on the back of your neck stand up. Walking down Bond Street on home leave, Eric Seward spots a member of his squadron, Captain Baillie, and hails him. Baillie scowls then vanishes in the crowd. On his return to duty in Palestine, Seward discovers that Baillie had never had home leave, and indeed had been shot down – at that very moment.

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NEWS – TUNNELS AND TUNNELLING

Croydon’s trams stabled in the Park Hill tunnels, LB Croydon

Croydon’s Tramlink system was divided into two separate operating parts from 23 July to 6 September 2009, as a result of engineering works on the tracks in the town centre. This left eight trams on the western part of the system, serving the Croydon to Wimbledon part of the lines. These trams were of course stabled overnight in the system’s depot at Therapia Lane. The fifteen trams on the eastern parts of the lines, serving trams between Croydon and Beckenham Junction, Elmers End, and New Addington were stabled under guard at Elmers End, and in the Park Hill tunnels (presumably with a guard at each end, and perhaps two more at the emergency escape

staircases leading up to the rifle range above the central tunnel roof).

SOURCE: ANON, 2009, Croydon tram fleet split in two. *Modern Railways* 66(732), page 79.

A tunnel puzzle at Crystal Palace, south London

Paul W. SOWAN

One of the standard histories of the London, Brighton & South Coast Railway refers to what seems to be a somewhat unlikely pedestrian tunnel connecting Crystal Palace Station (formerly known as Crystal Palace Low Level Station) to the main exhibition building. J.T.H. Turner's exact wording is as follows:

There was an inclined tunnel from the station to the Crystal Palace itself: the Author often used it. There were two stations built to serve the Crystal Palace exhibition and entertainment centre at Sydenham, where the Great Exhibition building erected in Hyde Park in 1851 was re-erected (in an enlarged form) in 1854. Turner is explicitly referring to the station still in use on Anerley Hill, the first part of which was opened as a terminus on a line from London Bridge by the LBSCR in 1854. It was subsequently rebuilt and extended with another line from Croydon via Norwood Junction, and the lines extended through the 746 yards Norwood tunnel towards Streatham Hill and Victoria. The surviving station, as rebuilt and extended, now stands as the most imposing example of Crystal Palace-era architecture in the district, the interior part housing platforms 3 and 4 being very fine. From the platforms up to street level at Crystal Palace Station Road (off Anerley Hill) is quite a climb up several flights of steps. And from the station entrance up to the top of the ridge on which the palace itself stood is an uphill walk of about a quarter of a mile. Any tunnel from the station to the Palace would necessarily be quite long, and steeply inclined, perhaps with steps in parts if not throughout. Examination of the station walls reveals no obvious trace of a pedestrian tunnel entrance. Local information refers to a surface but covered walkway from station to Palace, which is perhaps what Turner remembered. As he was born in or about 1929, he would only have been around seven years old when the Crystal Palace was destroyed by the last of a series of fires, on 30 November 1936, and the supposed tunnel rendered redundant. The second station serving Crystal Palace, known in its time as Crystal Palace High Level Station, was opened as a terminus by the London, Chatham & Dover Railway in 1865, and was closed in 1954. Your reporter (PWS) remembers a cavernous building with neglected platforms and no passengers in sight in its last years of operation. This building (now demolished) stood at a much higher elevation than the LBSCR station, alongside Crystal Palace Parade, directly opposite the Palace. There was certainly a 'subway' linking that station directly to the Palace, although definitely not 'inclined.' This structure, with internally ornate polychrome brickwork, is of course

still under the Parade, although not currently publicly accessible. Some years ago it was opened to the public each year on what was called the Subway Superday, when visitors could enjoy the fine brickwork and visit various traders' and exhibitors' stalls set up for the day. Postcards showing the interior can still be purchased locally. Visitors to the locality are advised not to miss the fine interior of the Low Level station, the Crystal Palace Park including the recently restored display of full-size Victorian replica prehistoric animals, or the Crystal Palace Museum (free admission www.crystalpalacemuseum.org.uk) at the top of Anerley Hill. The Museum is housed in a part of the former Crystal Palace School of Engineering, the only substantial surviving part of the Palace still usable. This is next to the base of Brunel's south water tower, where some of the waterworks pipework can still be seen. At the north end of the site, World War II bomb damage rubble has recently been removed to reveal the remains of the Palace aquarium.

SOURCE: John T. Howard Turner [c.1929–1990], 1978, *The London, Brighton and South Coast railway: II. Establishment and growth*. B.T. Batsford Ltd (page 51).



Crystal Palace High Level Subway. Photo by Nick Catford

Work starts on Crossrail, London

Construction of Crossrail was formally launched at the site of its new station at Canary Wharf on 15 May 2009. The first of nearly 400 steel piles, each 18.5 metres long, was emplaced at the station site in the old North Dock, between Canary Wharf and North Quay. According to the *London Railway Record*, a Crossrail Visitors Centre is open at 16–18 St Giles High Street, Tuesdays and Thursdays, 12.00 to 20.00hrs.

SOURCE: ANON, 2009, Crossrail launch followed by new design contract awards. *Modern Railways* 66(730), page 7.

The UK's so-called 'International Station' and Channel Tunnel services and connections

Eurostar (operators of passenger trains through the Channel Tunnel) boasts that it has now 'extended its range of through fares' with the addition of 18 stations in

Switzerland for which they can now sell you a ticket. Big deal! Before railway privatisation, most main British Rail stations could sell you a ticket to almost anywhere in mainland Europe. Years ago, without hassle, I bought a return ticket to Maastricht (Netherlands) at Redhill, for example. And a ticket to Jenbach (Austria) from East Croydon. Last time I bothered asking Eurostar (then still at Waterloo) for a ticket to Pulawy (Poland) or even just as far as Warsaw, I was told “we don’t do Poland”; and in fact it seems all they could offer was Brussels, Paris, or EuroDisneyland! Nowadays, I tend to buy all my mainland Europe tickets in Brussels, where they understand international travel!

SOURCE: ANON, 2009, Through fares to Europe. *Modern Railways* 66(730), page 6.

Camden Railway Heritage Trail, north London

Members of the Greater London Industrial Archaeology Society have all received, along with their copies of the *GLIAS Newsletter*, a complimentary copy of the railway heritage trail booklet detailed below. This is a quite splendidly produced and informative colour-printed booklet, of a convenient shape and size for those minded to explore this interesting part of Camden. It contains a fold-out map of admirable clarity, locating the main line Primrose Hill tunnel portals, the London & Birmingham Railway’s disused stationary winding engine vaults, other vaults associated with the Camden Lock area on the Regent’s Canal, and the several horse tunnels in the same neighbourhood. Those wishing to use this guide to exploring a fascinating area could start from Camden Town or Chalk Farm stations on the London Underground. DARLEY, Peter, 2009, *Camden Railway Heritage Trail, Primrose Hill to Camden Lock and Chalk Farm*. Camden Railway Heritage Trust: 20pp [ISBN 978-0-905042-37-4] £2.99. [Editor’s Note: Peter Darley gave an illustrated talk on this subject at Sub Brit’s Spring Conference in April 2009 which was followed by a detailed article with plans and photographs in *Subterranea* Issue 20, September 2009.]

‘I read it on the Web, it must be true’: the Ipswich Underground Railway, Suffolk

David Flett has reported a website describing the entirely fictional remains of an ‘Ipswich Underground Railway’ which never existed! Be warned!

SOURCE: FLETT, David, 2009, Going underground in Ipswich. *Greater London Industrial Archaeology Society* newsletter 243, page 11. [Editor’s Note: At least one Sub Brit member found this an excellent spoof. Have a look at www.ipswich-underground.co.uk and see what you think.]

Gotthard Base Tunnel breakthrough, Switzerland

A section of the Gotthard Base Tunnel, a railway tunnel currently under construction, was broken-through in June 2009. The last few metres of gneiss were bored-through on the Erstfeld–Amsteg section of the work. The 9.58-

metre diameter tunnel-boring machine had completed the part of the tunnel below up to 1,000 metres of mountain in 18 months, half a year ahead of schedule. Tunnel alignment with an adjoining tunnel section was excellent – the two lengths being out of alignment by a mere four millimetres horizontally and eight millimetres vertically. There is a tunnel access shaft at Amsteg.

SOURCE: ANON, 2009, Gotthard breakthrough. *Tunnels and Tunnelling International*, July 2009, page 6.

Unimplemented communist plan for tunnel to link Czechoslovakia with the Adriatic Sea, Slovenia

The sometime communist authorities in former Czechoslovakia had plans in 1975 to link Ceske Budejovice (in what is now the Czech Republic) with the Adriatic Sea port of Koper (Capodistria) in what is now Slovenia. The 225-mile rail tunnel would have passed below Austria.

SOURCE: ANON, 2009, Czechs planned tunnel to seaside. *Daily Telegraph*, 14 February 2009, page 18.

And Finally.... Appeal for Help with the Ice-House Project

Some thirty years ago, Sylvia Beamon was a founder-member of *Subterranea Britannica*. In 1990 Sylvia, aided by Susan Roaf, published the book *The Ice-Houses of Britain* (Routledge). This was the culmination of many years’ hard work and the first major treatment of these fascinating structures. The *Gazetteer* was the exclusive work of Sylvia over ten years aided by several keen Sub Brit members hunting these elusive, usually hidden or semi-hidden estate features. By necessity, a significant amount of information gathered as part of the project never made it into the book. In particular, many of the detailed plans of ice-houses were never published. Since the publication of the book, Sylvia has continued to collect information about ice-houses and the history of the ice trade. By her own admission she no longer has the time to devote to collating this additional information. With the Internet, there are now plans to republish the ice-house book in e-format. This would allow for the addition of previously unpublished material, perhaps as an Addendum to the main work. What is needed now is someone who can devote time to collating information in preparation for the publication of the e-book.

CAN YOU HELP? Sylvia is looking for someone who has enough time on their hands to look at the material she holds and collate and summarise the information for the book. Ideally you should be computer-literate but apart from that there are no prerequisites other than time! If you would like to help with this project, please contact Sylvia direct at the following address: 9 Newbolt, Royston, Herts SG8 5PU or by e-mail: sylvia@salisburyvillas.freeserve.co.uk

This is a fine opportunity to get involved in a new form of publishing and your help will be much appreciated.

James Fox has recently been pleased to donate to *Subterranea Britannica* his personal archives and photographs which will be added to the Sub Brit Collection. James is due to retire in two years time after 43 years of Government, bunkers and the military. He wanted to ensure a good home for this material.



North End tube station and the 'Bull & Bush' floodgate control centre

by Nick Catford with historical background on the floodgate control centre by Keith Ward

The Charing Cross, Euston and Hampstead Railway
Royal Assent for the construction of the CCE&HR had been granted under the 1893 Charing Cross, Euston and Hampstead Railway Act, but this only authorised an underground railway as far north as Hampstead. Financing difficulties meant that work hadn't started by the beginning of the twentieth century and the company was bought out by a syndicate led by American financier Charles Tyson Yerkes in 1900.

Following the purchase, plans were revised to continue the route northwards under Hampstead Heath to Golders Green where a depot could be built and where open farmland offered opportunities for property development. The new proposals met with strong opposition from residents of Hampstead and users of the heath who feared that the construction of tunnels would detrimentally affect the heath's ecology. The Metropolitan Borough of Hampstead also initially objected, but relented and parliamentary approval was granted for the extended route in the Charing Cross, Euston and Hampstead Railway Act of 1903.

One of the conditions for construction of the extended route was the provision of an intermediate station at North End, which would have been located on the north side of Hampstead Way, opposite Wylde's farmhouse. The station would have served a new residential development being planned to the north of the heath but this was scuppered by social reformer Henrietta Barnett who conceived the idea of the model housing development of Hampstead Garden Suburb in 1904. She instigated the purchase of the land for an extension to Hampstead Heath. This extension is an open space to the northwest of the main heath; it was created out of farmland, and its origins can still be seen in the form of old field boundaries, hedgerows and trees.

There was also much local opposition to the proposed station from the influential upper classes who lived on the heath; they didn't want the 'common folk' invading 'their' area at weekends by tube.

Work on North End station starts

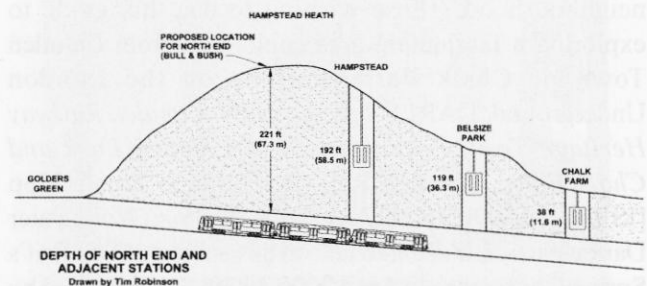
Tunnelling for the CCE&HR had begun in 1903 and initially plans for the construction of North End station continued at track level where the larger diameter station tunnels and low-level subways were excavated. It soon became apparent however that the abandoning of the proposed residential development would significantly reduce the number of passengers using the station. Work on the station was stopped in 1906 before the lift shafts were sunk and before any work on a surface building was started. Services began on the CCE&HR on 22 June 1907, running through the unfinished station.

Although the official name of the station would have been North End, it was referred to by railway staff as 'Bull &



The site of North End's southbound platform with bridge taking subway to lower lift landing. Photo Nick Catford

Bush' after the nearby well-known public house. Track-level construction included cross-passageways between the two station tunnels, platforms and two stairways up to subways that would have served both sides of a lower lift landing. The platform edges were removed in about 1933 to reduce maintenance and the platforms were later removed altogether, probably during World War II. During the war the unfinished and unlined subways were used to store archives with access only available from the cabs of passing trains.



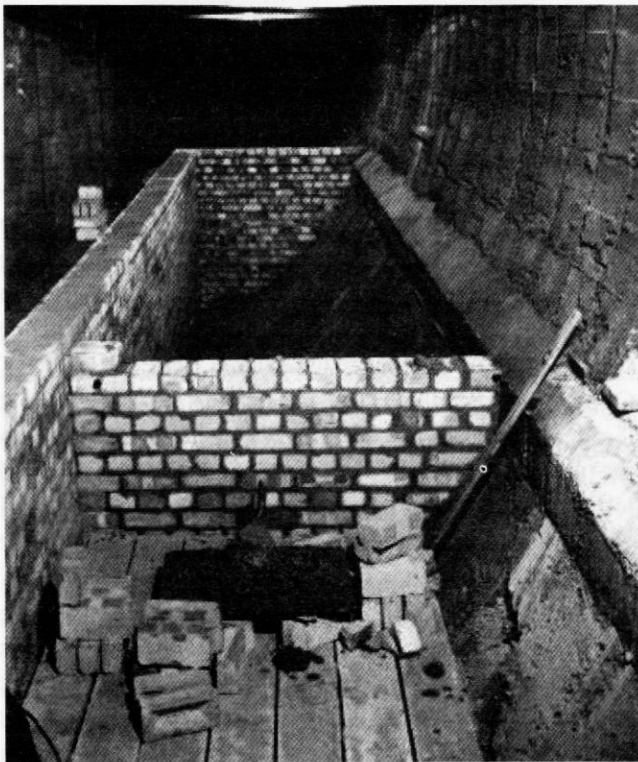
Underground control centres

Since the formation of the London Passenger Transport Board (LPTB) in 1933, the operational control centre of the underground network had been in offices above Leicester Square station (still used today as administration offices for the Northern Line management team). Leicester Square was the base for the traffic controllers for all tube lines, each in separate offices. The main controller for the entire network was based at 55 Broadway above St. James's Park station.

During WW2, some of the station tunnels at Leicester Square were adapted as emergency offices for the line controllers. A new control room was also established to operate floodgates which had been installed in tunnels near the Thames to stop water ingress if a bomb breached a tunnel. (At Balham station a bomb penetrated almost to platform level). Following WW2 the tunnels at Leicester Square were returned to their original use.

In 1953 with the re-establishment of a national civil defence network, steps were taken to keep the tube running in the event of a nuclear strike. The buzz words at that time were “due functioning” which basically meant continuing public services for as long as possible during and after a Hiroshima-sized atomic bomb (500 kiloton) had been dropped on the capital. This also applied to British Railways and the major utilities of electricity and water. A plan was formulated to build a bomb-proof centre for traffic control staff and administration, incorporating a central floodgate control room controlling all the gates on the network (there were also local control panels adjoining the gates).

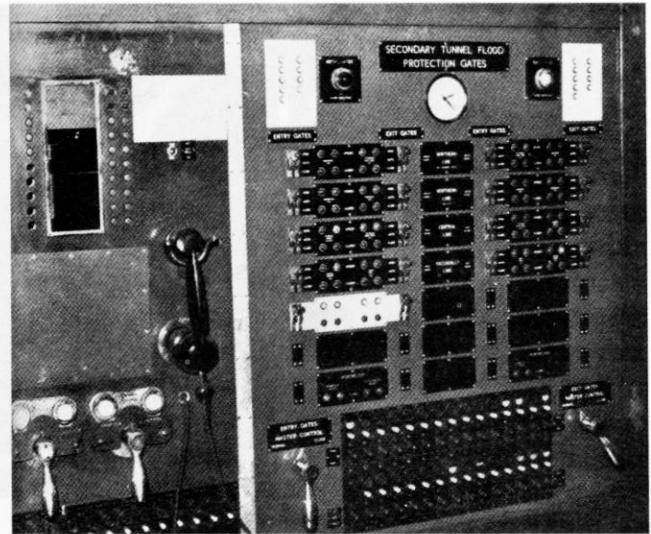
This project was under the banner of the ‘Special Works’ programme which also involved refurbishing the floodgates and installing new ones at strategic locations. The other project was the installation of a crossover at King’s Cross so that if the new floodgate at Russell Square was closed, the Piccadilly line could still operate between King’s Cross and Cockfosters. The plan was to operate the tube right up to and immediately after an attack. The whole ‘Special Works’ programme was given a high degree of secrecy.



Rooms under construction on the northbound platform in 1956. Photo Colin Tate

North End station’s new role

The chosen site for the main control centre was to be at the deepest point on the underground system at the uncompleted North End station deep under Hampstead. The original planned site of North End station entrance had been sold for residential development in 1927 and work started in 1954 at an adjacent site in the quiet Hampstead Way on London Transport property adjoining



Floodgate control panel

the LT-owned Manor House Hospital (now demolished). This involved building a small entrance blockhouse from where stairs led down to a new 33-metre shaft which was sunk down to the unfinished station subways; a low capacity lift was installed in the shaft together with a spiral staircase.

At platform level on the northbound platform area, a number of rooms were to be built, and at the first-floor level where the lower lift landings were originally to be sited a central two-level control room for the flood gates was constructed. The floodgate control room made use of a short existing tunnel where the control panel was installed and a lower floor was excavated for use as a battery room. In the subway between the control centre and the Northern Line a heavy steel blast door was fitted to seal the tube lines off from the control centre.

At platform level the brick shell of the offices was completed on the northbound platform. However in 1955 work was stopped following the nationwide cancelling of all civil defence control schemes when it was realised that with the immense power of the H-bomb there would be little left to control. The new floodgates and associated control room opened in 1956 but no staff accommodation was provided apart from a toilet. Plans for ‘due functioning’ controlled from the site – now actually called ‘Bull & Bush’ – were scrapped. No plans were made for control of the tube after attack apart from accessing what remained of the network and ‘see what can be done.’

Into disuse

The control room was maintained until 1984 when the opening of the Thames Barrier eliminated the threat of a tidal surge flooding London; by that time civil defence was a low priority. As late as 1991 the supervisor at Hampstead Station had to check the phones and equipment once a month – however the 1990 appendix to the rule book on flooding makes no mention of site and is a little vague on whether floodgates are in or out of use.



Stairs linking the new lift shaft with the North End station subway during construction of the floodgate control centre in 1956. Photo Colin Tate

Between 1956 and 1984, the control room would only have been manned in emergency as all floodgates had local control panels for the use of maintenance engineers. The control room was abandoned and the floodgates were not maintained but they remained intact as it would not have been cost-effective to scrap them.

It is likely that civil defence exercises would have seen use of the control room as LT maintained a substantial civil defence unit until all such industrial units were abolished in 1968.

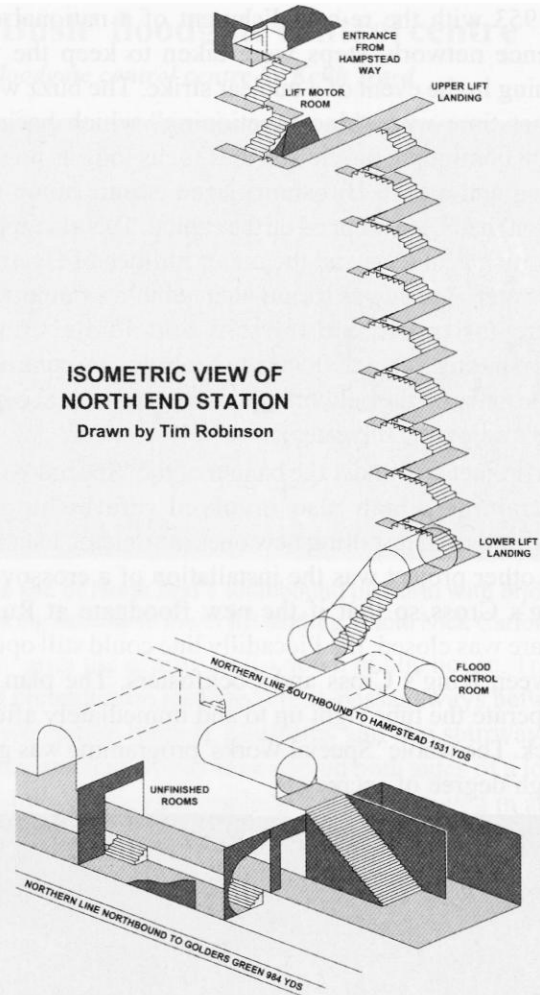
Since the control centre was abandoned at the end of the Cold War it has remained largely intact, although in recent years it has suffered some vandalism and graffiti. This largely happened at Christmas time when the Underground network closes down and intruders were able to walk 900 metres down the running tunnels from Golders Green station. Security and surveillance have now been upgraded to avoid a repetition.

Today the platform area is used for the storage of permanent-way materials and the stairs and the inconspicuous access blockhouse on Hampstead Way are retained for emergency egress from the Northern Line.

Sub Brit visit to Bull & Bush

In August 2009, fifteen members of Sub Brit were able to visit the unfinished North End tube station and floodgate control centre. This visit had been planned before only to be cancelled at the last minute so, as we waited at Golders Green station for our guide Andy Butler to arrive, we were all feeling rather apprehensive. Would the visit go ahead this time or would it be another disappointment? We were still in suspense when Andy arrived as apparently the supervisor who knew about our visit was on holiday and hadn't told anyone. Andy disappeared into the supervisor's office and five minutes later emerged with a smile on his face and a bunch of keys, the visit was on.

Kitted out in regulation orange hi-viz vests, we walked the half-mile to the entrance blockhouse on Hampstead



Way. The building stands a few yards back from the road and is surrounded by shrubbery and palisade fencing and could easily be mistaken for an electricity sub-station if there wasn't a notice fixed to the fence stating "Keep Clear – exit from emergency escape route".

Once inside the blockhouse, Andy rang the supervisor at Golders Green to tell him that we were going down to the platform level – the idea was that the supervisor would tell passing drivers that they might catch a glimpse of orange-jacketed people, but that didn't go to plan as he forgot to tell the drivers.

Just inside the entrance, there is a cutaway plan of the station showing the escape route and warning visitors that the shaft is 35.28 metres deep with 197 steps to the bottom. We descended a narrow concrete stairway to a landing with a small plant room for the lift motor and a glass fronted switch cabinet; from there a door led into a second empty room.

The concrete steps continued down to the upper lift landing. The lift was decommissioned many years ago and the power to it has been disconnected. From here a metal spiral staircase descends to the unfinished North End station. The spiral stairs finish at a lower lift landing from where a further flight of concrete steps leads to a junction. At this point we were in the original Charing Cross, Euston and Hampstead Railway station subways but still twenty feet above track level.



The floodgate control is now covered in graffiti.
Photo Nick Catford

The floodgate control room today

Straight ahead leads through a door into the floodgate control room. The room has been sub-divided longitudinally with metal panelling boxing in a mass of wiring and relays. The main control panel on the left has seating for two operators at a metal table in front of the panel; there is a telephone handset hanging on the panel. Most of the switches for operating the floodgates are still in place but it is now very difficult to read any of the labels as the whole panel has been painted in a variety of vivid colours by graffiti artists. On the right hand side there are two 1980s-style telephones fixed to the panel. In the middle of the panel a metal door gives access to a ladder down to the battery room below.

The flood control room itself is located in a section of original station subway but the lower room is a 1950s excavation. The batteries and racks of electrical switchgear are still in place and some circuits in the room appear to be live. In a small alcove there is a step up to a door with a notice on it that reads "DANGER This door opens onto the running tunnel above rail level."

Back at the junction at the bottom of the stairs there is a substantial steel blast door. Passing through that, the subway crosses the southbound track in the form of a bridge recessed into the roof of the running tunnel and then turns to the left and down a flight of stairs to one of the cross-passages between the two platforms. To the left steps lead down to track level on the northbound line.

Down to platform level

The steps are there for emergency egress if passengers have to detrain between Golders Green and Hampstead. There is a sign on the wall indicating that it is an 'emergency exit'; from here the route up to the surface is well lit and signed. Apart from some permanent-way material under covers the platform area is completely clear and there is some evidence of the now removed platform. There is a modern switch room at the southern end of the southbound platform space.

Turning right at the bottom of the stairs a series of partially built brick rooms is still be seen at the south end of the northbound platform area. A brick wall has been built up to roof level for about forty feet but only one room was actually built and this contains a sink which still has running water and a toilet. A safe walkway with railings and steps has been constructed through this area in recent years to allow detrain passengers to reach the emergency exit from the platform area at the end of the wall.

At this point there is another cross-passage with another flight of steps that would have led up to the other side of the lift landing. As this isn't an emergency escape route, the steps and the upper-level subway are unlit and unused and there is no handrail on the stairs.

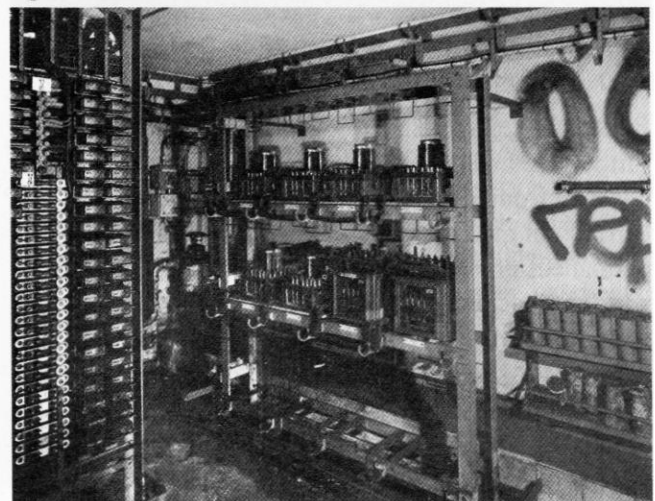
At the top of the steps, the subway turns to the right and once again crosses the southbound line on a bridge and then turns to the right again where a metal door opens into the bottom of a shaft; it is assumed that this is the bottom of the 1954 shaft. The shaft is roofed over about eight feet up and there is a ladder on the wall up to a trapdoor in the ceiling; unfortunately we didn't have time to investigate this.

We were unable to access the other cross-passages as this would have involved walking alongside the track. The platform tunnels, stairs and subways are clearly unfinished and have never been tiled.

Time for a drink

It was now time to return to the surface from what would have been the deepest station on the underground network. It seemed fitting that we should end our morning with a pint or so at the nearby *Old Bull & Bush*, the pub that gave the station its nickname.

It was a warm and pleasant day and we were able to sit outside which was lucky for, as usual, some of us were blacker than others! I'm sure the landlord wouldn't have welcomed us inside and even some of the other customers seemed to give us a wide berth. Nevertheless, conversation was lively after such an excellent excursion. Our thanks go to Andy Butler and colleagues for making it possible.



Battery room below floodgate control room. Photo Nick Catford

Floodgates on the London Underground

Part 1 — A Brief History

R. Kenneth

When the original deep-level tunnels were bored beneath the river Thames in 1889 little thought was given to the potential threat from flooding. There was no protection for the tunnels in the event of a tunnel breach.

During the First World War London experienced a new form of deadly innovation in warfare: aerial bombardment. This raised concerns that the riverbed and the railway tunnels beneath them were vulnerable to aerial attack and so certain protective measures against enemy action were put in place in the Bakerloo Line tunnels (it was thought that the Northern Line tunnels were too deep to be in danger). Steel framework supports were erected into which large heavy baulks of timber could be dropped to seal the tunnel mouths at the south end of Charing Cross and the north end of Waterloo. Large-capacity pumps were also installed.

A case was made for the timber to be replaced by steel doors but this was rejected as all available steel was allocated to the war effort.

This method was slow and labour intensive taking ten men about 45 minutes to install and only protected the network from water coming into the tunnels from a breach in the tunnel roof under the Thames.



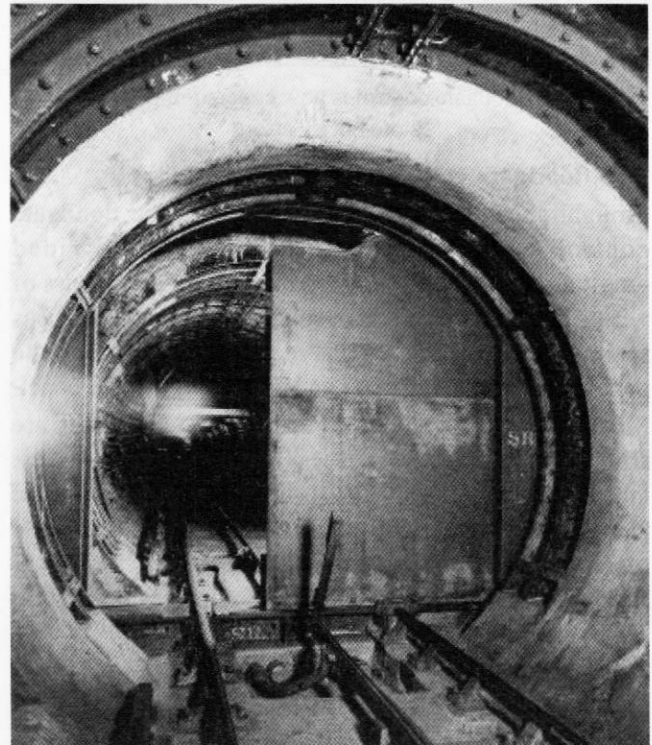
Manual Floodgate inserts from the 1930s using metal plates instead of timber.

In 1919/1920 the Bakerloo under-river tunnels were further lined with iron plates welded at the joints. It is not clear from the documentation available why this was carried out at such a late date but was said to provide permanent protection (although one theory was that it was to protect the tunnel wall from being damaged by a derailling train).

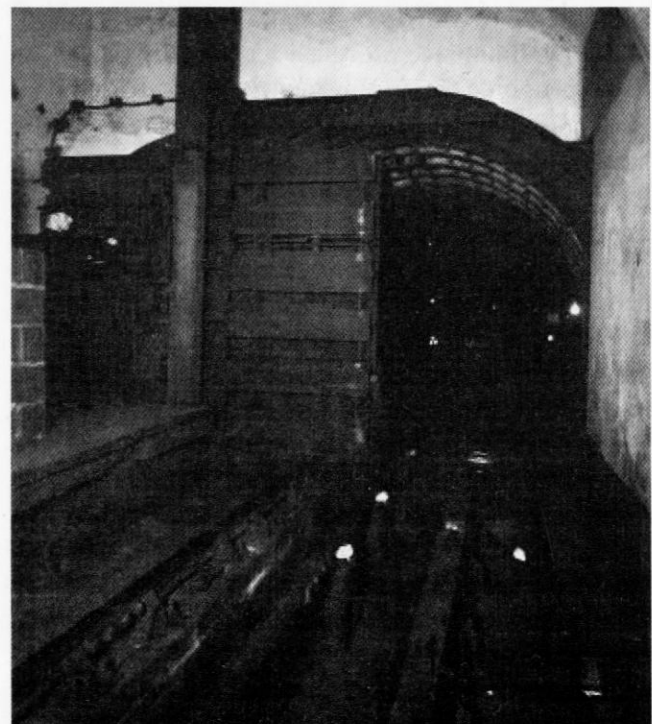
Early in 1938 with the threat of war once again bringing increasing danger from aerial bombardment, the problem of flooding to the Underground system was re-evaluated. During the autumn of 1938 which culminated with the Munich agreement, it was necessary for emergency

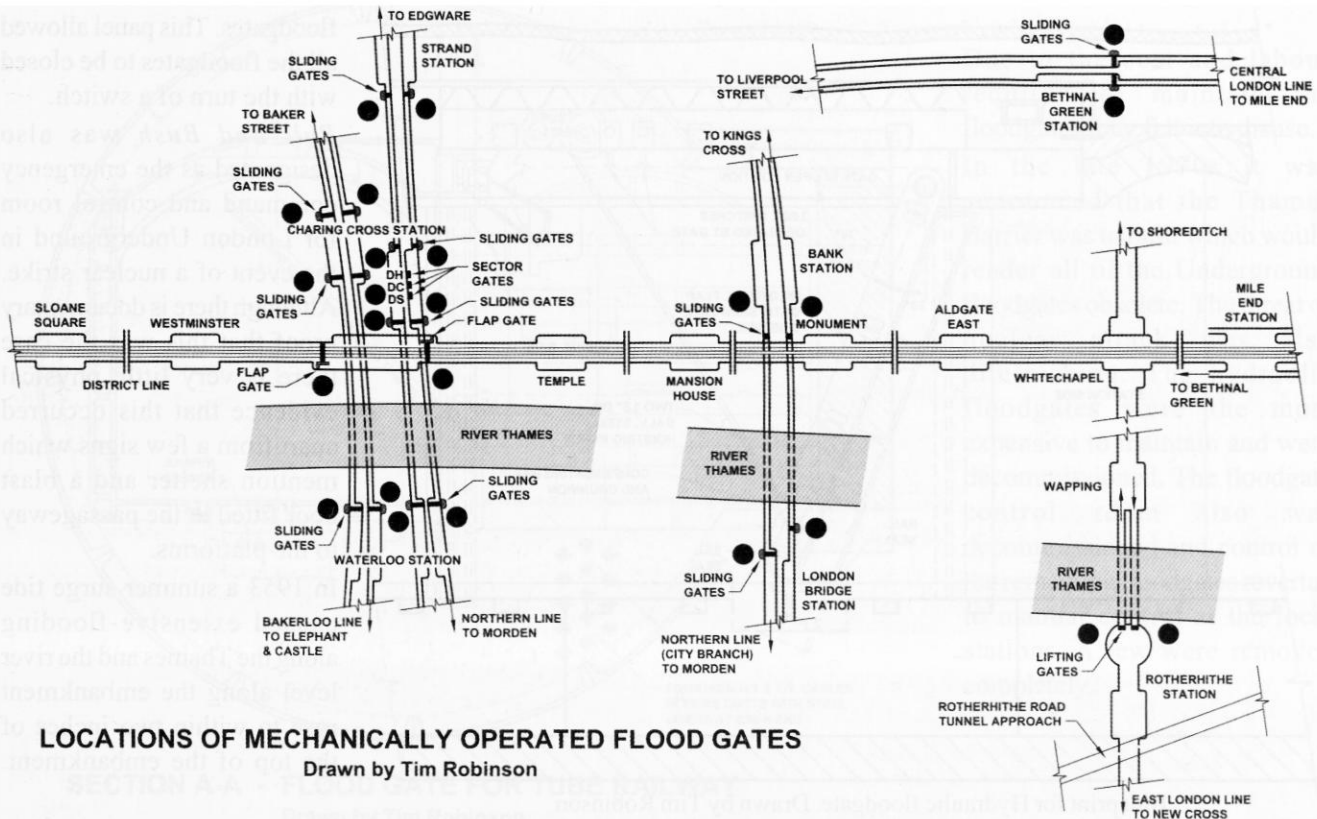
measures to protect the Underground railways to be implemented. Under-river rail tunnel traffic was stopped and concrete bulkheads were placed in the tunnels of the Northern and Bakerloo lines.

The flood defence system was considered to be inadequate and a crash programme of renewed flood defences was implemented. This included the fitting of sliding floodgates at critical tunnel locations and the fitting



Sliding floodgates.





LOCATIONS OF MECHANICALLY OPERATED FLOOD GATES
 Drawn by Tim Robinson

of watertight doors on stations and subways. Some unused tunnels under the Thames were plugged with concrete for the duration of the war. This work was completed by 1940 allowing trains to run under the Thames again, only stopping in the event of an air raid which required the floodgates to be closed.

These defences gave protection to the Underground system in the event of a tunnel breach under the Thames allowing water to flood in, and from the danger of sewers and water mains being breached allowing water to enter the system from the stations.

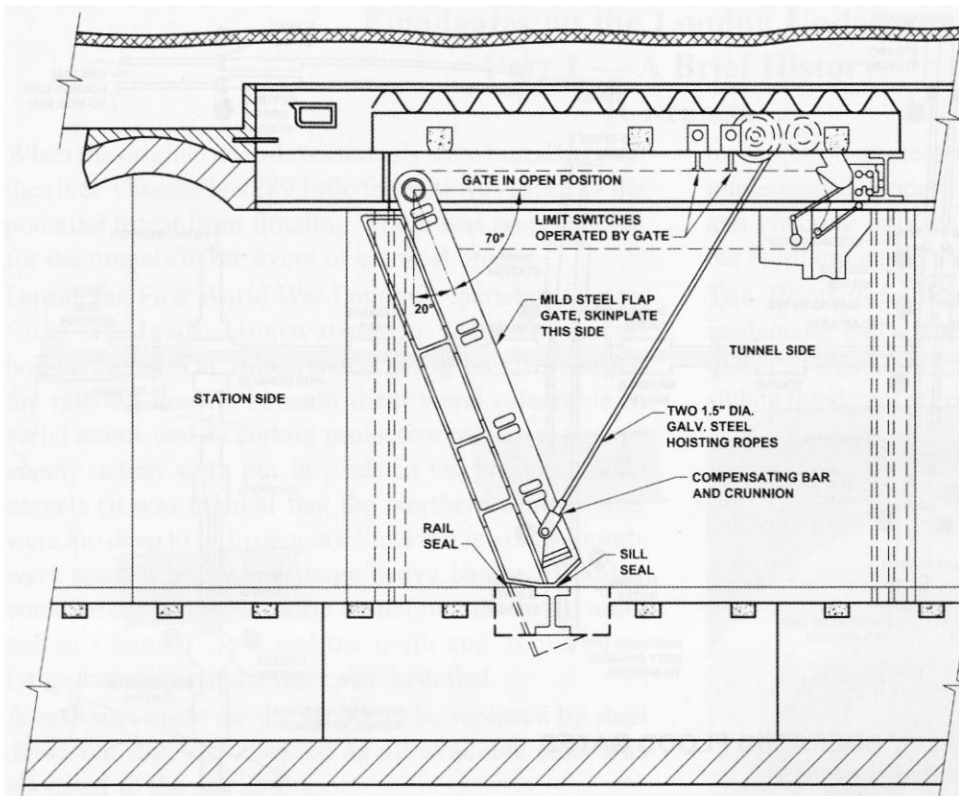
The watertight doors on the stations and subways were controlled by the local station staff. The floodgates were closed manually by a floodgate attendant on the orders of the floodgate control room located at Leicester Square station. This control room is described in *London Transport at War* (Charles Graves, 1978):

"...it is an unpretentious little room, about twelve feet wide and twenty feet long, equipped with three swivel chairs, six telephones, a big switchboard and the actual control mechanism. This looks rather like an iron upright-grand piano but only half the width. There are coloured lights alongside each of the numerals representing the floodgates. Here sat the controller who, by pulling a 3 inch lever, could guarantee that every floodgate attendant would be warned of an impending bomb. The turning of the lever gave the signal for the immediate closing of the floodgates."

The modern sliding floodgates weighed in excess of six tons but could be closed by one person in four minutes.

During the aerial bombardment of London — the 'Blitz' — there was only one incident of note when bombs fell into the Thames and damaged the tunnels. This was a direct hit on the abandoned Embankment loop tunnel under the Thames. Divers confirmed that the crater had exposed the tunnel roof and had fractured the crown for 8 feet. This tunnel had been previously blocked with concrete at the time and it was noted that the concrete bulkheads showed signs of increased pressure. The breach was sealed with concrete in bags and a layer of clay covered the crater. The tunnels are still assumed to be completely flooded to this day.

Following the war, a new flooding threat to the Underground raised its head: the Atom bomb. It was realised that if central London took a direct hit from a ground-burst atomic bomb (and later the H-bomb) the blast crater could breach the defences in place from World War II and allow the Thames to flood the system. A new series of floodgates was built between 1953 and 1957 which were up to two miles away from the river Thames. The new floodgates provided a ring of protection to the Underground. The theory was that if central London was hit and the Thames entered the Underground system, these new gates would prevent the rest of the system being flooded. The new gates were hydraulically operated and hinged down from the tunnel roof to seal the tunnels (using gravity to close and hydraulics to raise again). These gates were also of a heavy enough construction to provide some measure of blast protection to the tunnels beyond.



Blueprint for Hydraulic floodgate. Drawn by Tim Robinson

floodgates. This panel allowed all the floodgates to be closed with the turn of a switch.

Bull and Bush was also designated as the emergency command and control room for London Underground in the event of a nuclear strike. Although there is documentary proof that this was the case there is very little physical evidence that this occurred apart from a few signs which mention shelter and a blast door fitted in the passageway to the platforms.

In 1953 a summer surge tide caused extensive flooding along the Thames and the river level along the embankment rose to within two inches of the top of the embankment.

Obviously the former floodgate control room at Leicester Square station was deemed to be inadequate as it would probably be destroyed in the event of a nuclear attack.

To replace it, a never opened and partially completed station on the Northern line north of Hampstead was chosen to be the new floodgate control room. North End (or *Bull and Bush* as it is more commonly known) was built during the expansion of the Northern line to Golders Green in the early 1900s.

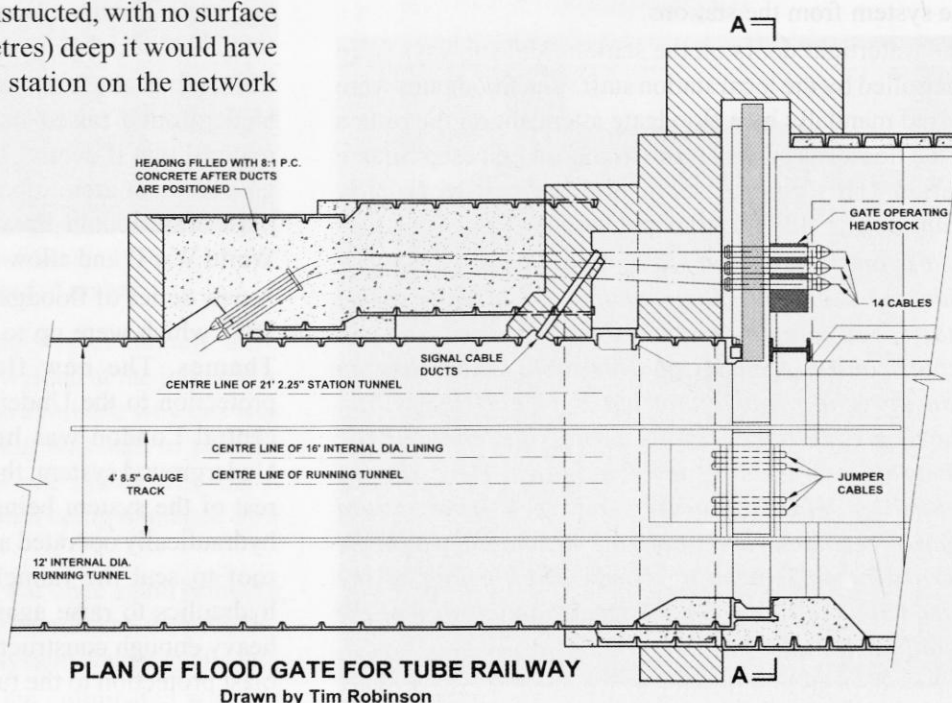
Due to problems with the surface planning permissions, only the platform areas were constructed, with no surface buildings. At over 220 ft (70 metres) deep it would have been the deepest Underground station on the network had it opened.

This made it perfect to site the floodgate control room as it was likely to survive a nuclear strike on central London. A new access shaft was dug connecting the surface with the station below. A lift and stairs were installed to allow access.

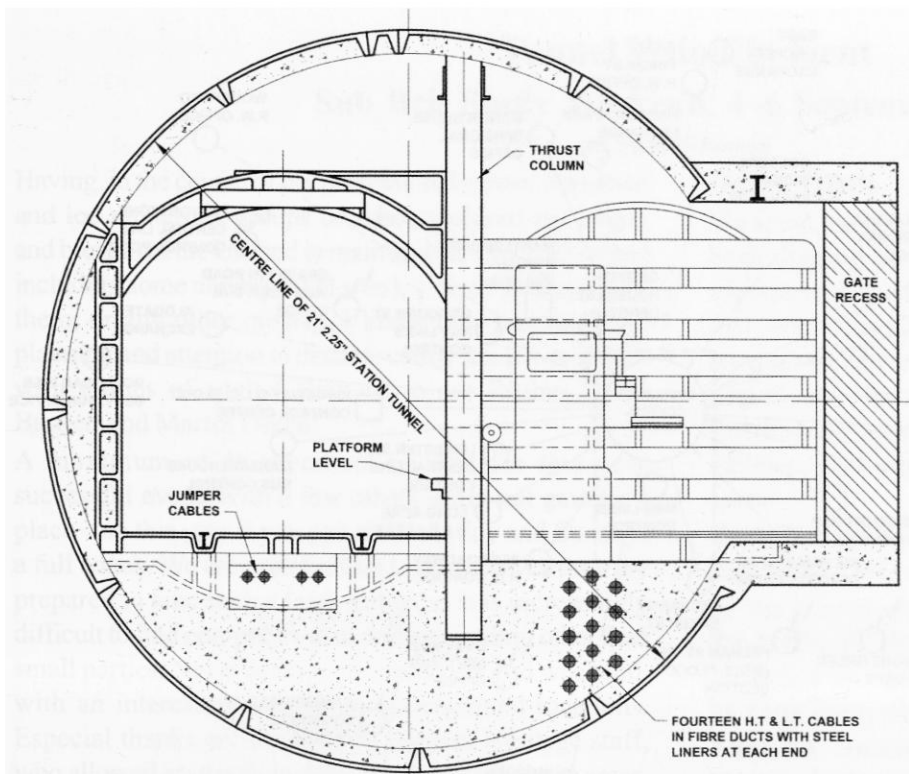
The control panel for the Second World War floodgates was moved from Leicester Square station and relocated to the new floodgate control room at *Bull and Bush*. A new panel was also built to control the new hydraulic



Lighting sign at top of stairs at Bull and Bush mentioning shelter.



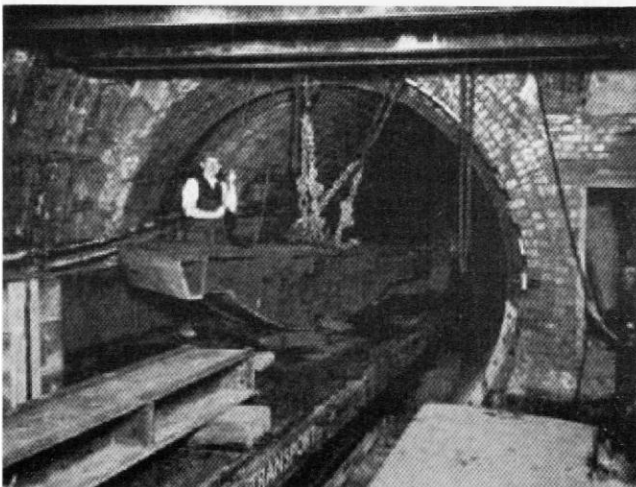
Engineering drawing of Sliding Floodgate.



SECTION A-A - FLOOD GATE FOR TUBE RAILWAY

Drawn by Tim Robinson

Due to the cost and labour required to maintain the floodgates they fell into disuse. In the late 1970s it was announced that the Thames Barrier was to be built which would render all of the Underground floodgates obsolete. The threat of nuclear attack was also diminishing. The hydraulic floodgates were the most expensive to maintain and were decommissioned. The floodgate control room also was decommissioned and control of the remaining floodgates reverted to manual control at the local stations. A few were removed completely.



Installing sliding floodgate at Embankment (Bakerloo Line) showing the floodgate base plate being installed.

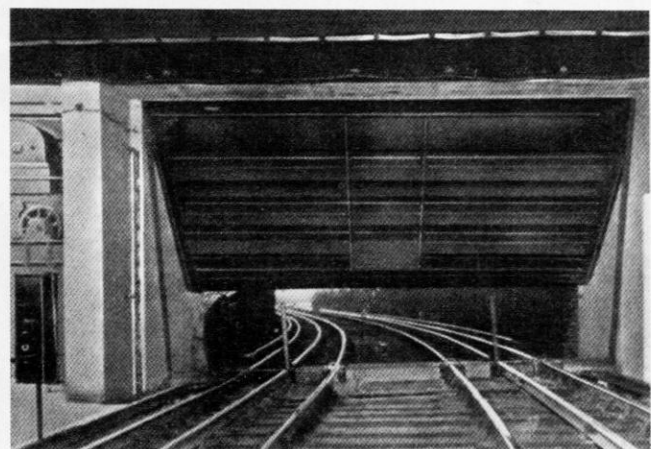


Flood doors fitted to station entrances and subways

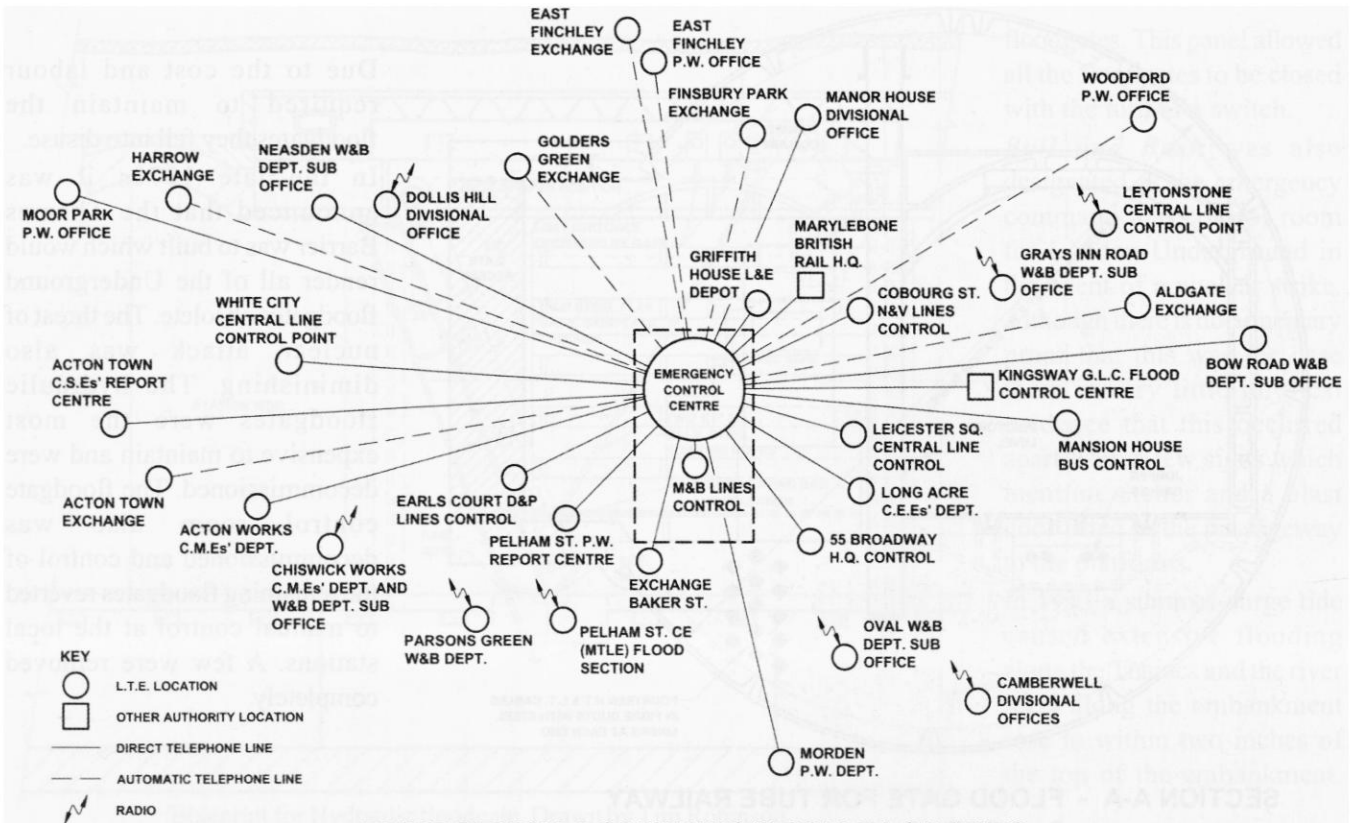
This gave further warning that flood defences were needed.

The threat of Thames flooding coupled with the threat of nuclear attack meant that the floodgate control room was constantly manned through the 1950s and early 60s. This was reduced during the late 60s and early 70s to being manned only during flooding alerts.

During the 1970s the floodgate control room was being hardly used and was only manned during an annual floodgate test. According to popular London Underground engineering myth the last test of the floodgates was a disaster as the hydraulic floodgates closed but refused to reopen and had to be manually retracted (I haven't been able to prove this story but have heard this from a number of reliable sources).



Double track flap-style floodgate. Installed on District Line at Embankment. (this is a mock-up photo of what the installation should look like)



EMERGENCY COMMUNICATION FACILITIES

Drawn by Tim Robinson

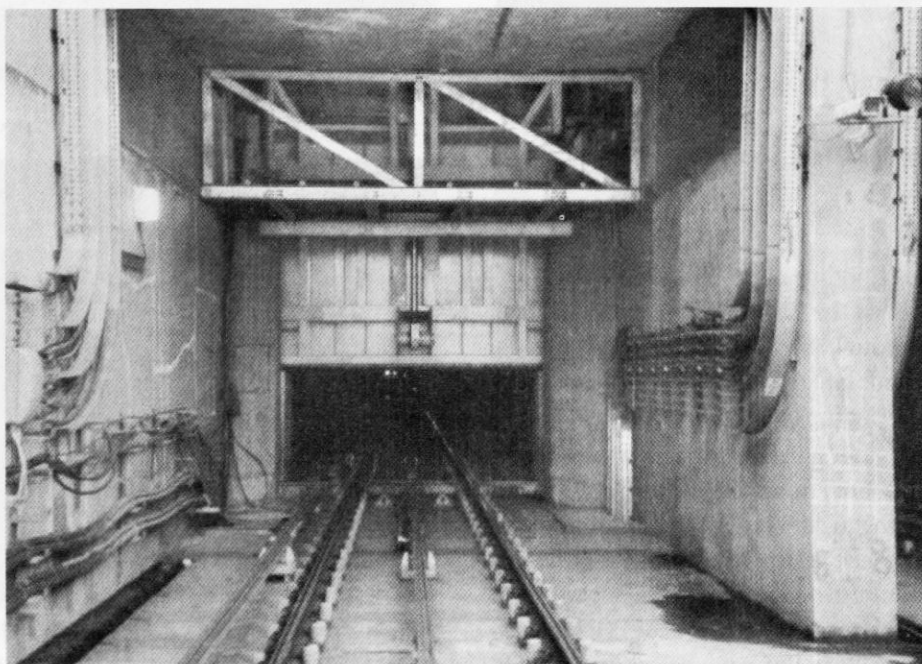
The majority of the watertight doors were removed and the rest decommissioned. The coordination of the floodgates was moved from *Bull and Bush* to an office at Baker Street. This had a telephone link to the GLC flood control centre at Kingsway.

When the Thames Barrier became fully operational all the floodgates on the Underground were decommissioned. Only the Bakerloo Line floodgates remained in operational use up to the 90s due to some engineering

works which took place on the tunnels under the Thames. They have now also fallen into disuse.

When the Jubilee Line extension was being built in 1996 a floodgate was installed at Canning Town tunnel portal. This was to protect the tunnels from flooding only from the river Lea which runs alongside the Jubilee Line and not from the river Thames itself.

At the time of writing there are no plans to revisit the floodgates and bring them back into commission.



Canning Town floodgate on the Jubilee Line. Photo by Andy Harkness.

'Tunnel Vision' in Kent

Sub Brit Study Weekend, 4–6 September 2009

by Paul W Sowan

Having, in the course of my professional career, organised and led numerous groups of schoolchildren the length and breadth of the UK and in mainland Europe (and indeed including some underground sites), without losing any of them, or any other mishap, I know how much careful planning and attention to detail is called for. It is no easier with groups of adults! Hats off to our leaders Linda Bartlett and Martin Dixon!

A maximum of 48 members booked for this very successful event, with a few others sadly not gaining a place – so this year it was (on the Saturday and Sunday) a full coach. We are grateful that Linda and Martin were prepared to take such a large group, as it is increasingly difficult to find non-public sites willing to admit other than small parties. Nevertheless, we had a very full weekend, with an interesting variety of underground locations. Especial thanks are tendered to English Heritage staff, who allowed access to usually very much off-limits areas, and devoted a great deal of the Friday to showing and explaining seldom visited places.

Linda and Martin sent out a good set of joining instructions in advance, and, unusually for our Study Weekends, our first day of full visits was on the Friday. We were especially fortunate this year in that our hosts at three of the sites handed out A3 photocopies of detailed maps and plans, a very welcome feature of the weekend.

Friday 4 September: Dover Castle – not quite ABC, but we did get to D!

The weekend commenced with a full day exploring some of the nether recesses of Dover Castle. Subterranea Britannica has visited other non-public areas here in previous years, so by now we have probably collectively seen most, although not yet all, of the underground parts. The entire district is a good one for tunnels in the chalk, and the three railway routes in and out of Dover all pass through long tunnels in that formation.



Sub Brit party at Dover Castle. Photo by Clive Penfold

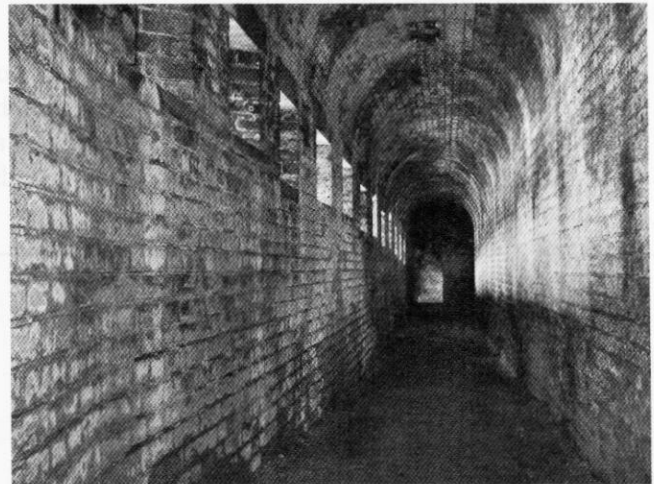
Dover Castle

We spent the whole of Friday at the Castle. People have been digging here for a very long time: amongst the earliest suspected work was the building of an Iron Age fort where the Castle now stands. The Romans were here too and there are the substantial remains of a pharos (lighthouse) still standing to several storeys within the Castle, and fragments of another one at the Western Heights. And there is a Saxon church also within the castle.

William the Conqueror caused the first castle to be erected here after 1066, although traces have been obliterated by the greater structure commissioned by Henry II in the 1160s. By the 1180s this was amongst the greatest fortresses of western Europe. Building was continued by King John, who completed the outer defences,

Eastern battlements (Avranches Tower and Hudson's Bastion) at Dover Castle

The eastern battlements of the Outer Bailey include structures from the twelfth century onwards, although with considerable additions and modifications right through to World War II. Passages have been tunnelled through the original defensive banks to give access to forward defence positions such as the East Demi-Bastion, East Arrow Bastion, Hudson's Bastion, and the Horseshoe Bastion.



Firing gallery at Hudson's Bastion. Photo by Barry Stewart

Our visit took in some of these tunnels, underground rooms, and firing positions in the neighbourhood of the 1180s Avranches tower, and of Hudson's Bastion. Perhaps what members thought most impressive in these areas was the quality of the eighteenth-century brickwork, with intersecting curved faces executed with immense care and skill using individually shaped bricks. And, compared with the sadly inadequately protected structures at the Western Heights, the brickwork and stonework here are remarkably clean. It was interesting to see

examples of restored intricately shaped stone gun loop surrounds, although not in the original Caen stone from the no-longer-worked underground quarries in Normandy. These areas are not generally open to the public, other than on guided tours for special interest groups.

Medieval tunnels at Dover Castle

The Castle's original main entrance was sited in a strategically inadvisable position at the northern end, where it was overlooked by higher ground. This entrance was attacked in 1216 by the French. A palisade at the north gateway and a stone tower was undermined, the French digging timber-propped tunnels under the defences, and then destroying (by fire) or withdrawing the support, causing the masonry above to collapse. The

attackers occupied the outer defences, but made no further progress in the face of strong opposition from the garrison. The breached defences were rebuilt, with a defensive subterranean tunnel system. The North Gate was abolished, the main entrance being relocated to what is now Constable's Gate, at the top of the steep hill overlooking the town.

The medieval defensive tunnel system, much elaborated in subsequent centuries, has unrestricted public access during Castle opening hours, and contains an intriguing series of traps and obstacles to hinder any further attackers. At one point the rock-cut defensive tunnel through flinty chalk cuts through one of the rather smaller French mine tunnels.

THE 18th to 20th CENTURY TUNNELS IN THE WHITE CLIFFS

Folklore has long had it that the cliffs at Dover Castle conceal tunnels on six levels, namely:

- A Annexe
- B Bastion
- C Casemate
- D Dumpy
- E Esplanade
- F Foundation

Annexe, Casemate and Dumpy all exist and are interlinked. Esplanade level refers to a set of passages at the base of the cliffs that were linked together in World War II to create air-raid shelters. Use of these names to describe the various levels appears to date from the period of Home Office occupation (1958 onwards). As for Bastion and Foundation, no primary source has been found that mentions these levels. Bastion was allegedly started in 1944 and later abandoned after collapsing. There are some drains beneath Esplanade but this hardly constitutes an occupation level. It is possible that Bastion and Foundation are virtual levels, created in order to get a more logical 'backronym'.

Perhaps in time more will be discovered about these 'missing' levels but as far as the weekend goes, we were able to visit Annexe and Casemate as special groups on the normal public tour. Dover Castle attracts more than 300,000 visitors a year, making these tunnels one of the UK's most popular underground attractions. With great assistance from Lyndsay Ridley of English Heritage and Sub Brit member Mark Bennett, we were also able to visit Dumpy level. Esplanade level was out-of-bounds for the weekend due to the presence of roosting bats but we hope to visit on a future date.

Casemate tunnels at Dover Castle

These tunnels were started in the eighteenth century as underground barracks or 'subterraneous bombproofs', and as a suitably elevated position in the cliffs to house guns. Seven long tunnels running straight back into the cliffs at this level were first made, in anticipation of a possible Napoleonic invasion, in the years 1797-1810. These were for a time used to house big guns, and were provided at their inner ends with vertical vent shafts to the surface, so that smoke could be voided.

A short entrance tunnel made in 1797 slopes gently downwards to the famous 'balcony' on the face of the cliffs, overlooking the Eastern Docks. Here is the entrance to the public areas, via the shop and a small café. The first four large tunnels, originally barracks for soldiers, are interlinked, and communicate also with another three such tunnels for officers. The system was extended in



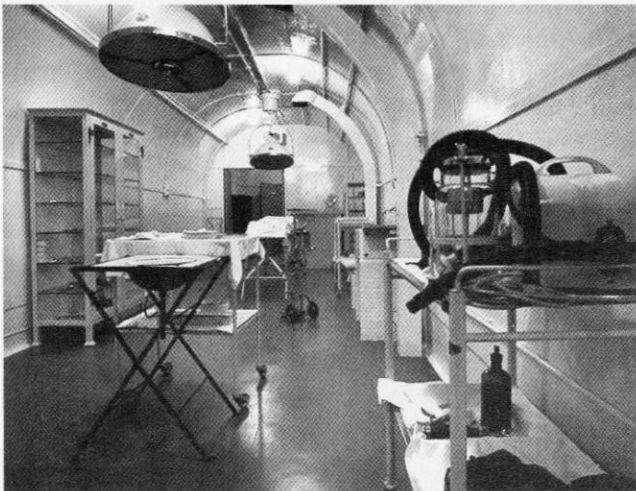
The telephone exchange in Casemate Level.
Photo from English Heritage

1941–1943; an eighth long tunnel being added, and an underground telephone exchange. A double spiral staircase to the surface (near the head of the lift shaft serving Dumpy) was added in 1870. These tunnels are, again, now fitted out to retell the story of their uses during the last war, and open to the public.

Particular attention is given to the role of Vice-Admiral Bertram Home Ramsay [1883–1945], who directed the evacuation of the British Expeditionary Force from Dunkirk in late May 1940 from his headquarters here. Sadly, he died in an air crash in France on 2 January 1945, so did not see the end of the War. His statue stands on the cliffs above.

Annexe Hospital tunnels at Dover Castle

This tunnel complex lies back from the cliff and above Casemate level. It has its own entrance some way up the pathway from the Casemate entrance. It was excavated in 1941–42 as a purpose-built underground hospital (technically an MDS – Medical Dressing Station). It is now open to the public, fitted out to convey an impression of its wartime use. Visitors ‘follow’ an injured airman as he is taken inside for treatment after ditching in the Channel.



Operating theatre in Annexe Level.
Photo from English Heritage

Dumpy Level at Dover Castle

The Dumpy level tunnels were built in 1942 and are positioned 50 feet beneath Casemate level. The tunnels were constructed to act as a large new Combined Headquarters (CHQ) for all three armed services. This CHQ would potentially have served as back-up to the main D-Day Headquarters in Portsmouth. Access was originally via a number of stairways from the upper tunnel levels. Parts of Casemate and Annexe were also used as overflow accommodation for the CHQ. By 1958 Dumpy and most of the rest of the tunnels were surplus to military needs and they were taken over by the Home Office. The complex was adapted to become one of ten Regional Seats of Government (RSGs) in England.

The RSGs would have provided secure accommodation from which to provide some form of local government in



The BBC studio and office in Dumpy Level.
Photo by Nick Catford

the event of a nuclear attack. Large amounts of money were spent on the RSG, including upgrading the power, air conditioning and communications infrastructure. A lift was installed in the early 1960s which led from the surface through Annexe and Casemate levels to terminate at Dumpy level. We were privileged to be able to enter Dumpy via this lift – as would the civil servants who would have staffed the RSG. Firstly we were given an extensive Health and Safety briefing to ensure we could evacuate swiftly and safely in the event of a fire alarm. We were also equipped with face masks as protection against the fungal spores which are a potential hazard. Once we had descended in small groups we could see that Dumpy level consists of a large warren of mostly empty tunnels and rooms, although on a more or less rectangular grid. The groups were ably led by Sub Brit members and experts Mark Bennett and Robin Ware. Although most of the fixtures and fittings are absent (removed on closure or in store elsewhere), the technical services are all intact and in working order. The purpose and date of each part of the complex was explained, some of it easily recognizable (eg the BBC studio), others less so. At one point a Napoleonic tunnel is cut through, elsewhere partially completed building work shows that construction continued until the tunnels were finally abandoned by the Home Office in 1986-7.



Narrow-gauge contractors rail incline used during the excavation of the tunnels at Dumpy Level.
Photo by Nick Catford

At one point after radioing to disable alarms, the groups were able to briefly exit onto the cliff face where the remains of an inclined railway and winch room were visible. As this is where the spoil from the excavations was dumped, it is a possible derivation for the name by which the level became universally known. We exited the complex by one of the stairways – a long climb out after seeing an intriguing part of Cold War history.

After this comprehensive and exhausting day exploring in and under Dover Castle, we made our way to Canterbury, and the Rutherford Hall of Residence in the University. There to greet us was the new Sub Brit banner, proclaiming our presence for the weekend. Martin & Linda greeted us (again) and gave out packs of notes and information for the weekend and pointed us in the direction of our rooms. Basic student accommodation was ours, but very acceptable. About half the group then gathered for dinner in the Refectory, whilst others sought out local hostelrys for refreshment. It was good to meet up with old chums again and to start to make the acquaintance of several new members on a Sub Brit trip for the first time.

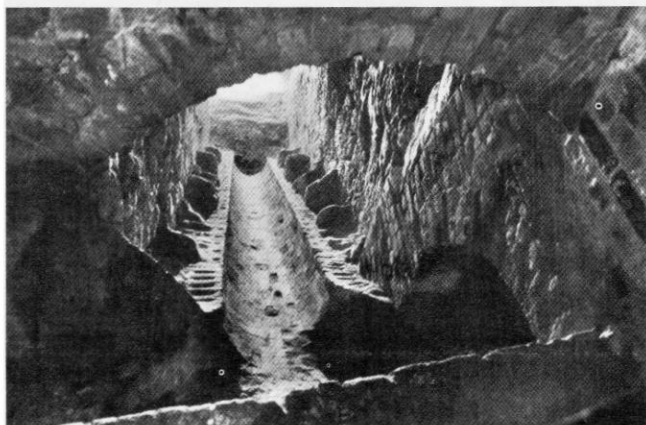
Saturday 5 September

The day dawned fair, and we trooped down to breakfast in the Uni – a comprehensive buffet here of hot and cold, so plenty to keep a vegetarian going. We also picked up our packed lunches before heading out to meet our bright orange Crosskeys coach for the day and set off on the road.

Fort Amherst, Chatham

My first visit to Fort Amherst was some years ago, as a member of a standard public guided tour. This, my second visit, was revelatory! With an immensely enthusiastic and knowledgeable guide, recent developments, and access to non-public areas, we had a morning to write home about!

The whole land area, and the tunnelled parts, are more extensive than I thought. The tunnelled and publically visitable parts are driven into a chalk hill lying between Chatham town centre and the dockyard. We have Dutch invaders in 1667 to thank for Chatham Dockyard's defences, although Fort Amherst was not built until 1758.



Latrine chute at Fort Amherst. Photo by Clive Penfold

The underground parts date from 1776 to 1805, providing a secure ammunition supply route to magazines and firing positions, and are thought to incorporate some pre-existing man-made 'caves'. The maximum armament is said to have been 125 guns. This fort is of particular historic importance in that it has not been subsequently modified in Victorian times, and is thus an outstanding example of Georgian military architecture.

The immediate entrance area is being fitted out to resemble its appearance during the last World War. A highlight, further into the hill, was the suite of lavatories – adjoining facilities for officers and men, with once-curtained private alcoves for the former, and communal seating for the latter. But there was no class distinction in the cesspit into which the chutes from both these facilities communicated. Emerging into sunlight here and there at various levels added greatly to one's appreciation of the visit, and to one's sense of orientation and of the strategic rationale of the entire structure. Beyond the public area, on the top of the fort, we were conducted around the crumbling remains of further impressive tunnels, buildings and underground rooms.

Military, ARP and Civil Defence personnel had all vacated the fort in 1956, and twenty acres are now owned by the Fort Amherst Heritage Trust, who purchased the site from the Ministry of Defence in 1980. Substantial parts of the tunnels and upper surface are now regularly open to the public.

Eastry chalk mine, Eastry



Entrance to the Eastry chalk mine. Photo by Martin Dixon

Although I have visited this curious excavation, seemingly part serious chalk mine, and part whimsy, on several occasions over the decades, there are always new details to notice. It is entered via a trapdoor in a garden at the rear of a private house, the occupants of which kindly allow access for organised visits in return for a donation to charity.

A good description, history, and plan of this complex of chalk tunnels, by Rod Le Gear, has recently been published. The tunnels appear to have been commenced about 1811 by one Abraham Foord for mining chalk for

lime burning. And a lime kiln is known to have stood nearby. A plan made by Henry Foord in 1833 shows 680 feet of tunnels, and mining by Frederick Foord was still in progress in 1907.

What you encounter under the trapdoor in the garden nowadays is an entrance series of narrow curved tunnels and steeply descending steps, and an associated vertical shaft, all of which constitutes a small-scale three-dimensional maze. Whoever dug this part seems just to have been having fun, rather than labouring purposefully to earn an honest crust. The only rational element, from the point of view of chalk mining, is the shaft (now sealed at the top) by means of which chalk could have been hauled to the surface. There was, it seems, also a perfectly practical drift entrance (now sealed) through which men could come and go, and chalk could be wheeled out in barrows.

At the lowest level there is a single long tunnel, with a few cross tunnels at right angles to it, and a few shorter lengths of tunnel parallel with the main long one. However, this is far from a regular pillar-and-stall chalk mine with galleries laid out on a rectilinear grid. The principal concession to rationality appears to be the driving of the long tunnels quite precisely at right-angles to the principal or only jointing in the rock: this is the safest approach in this sort of mining. The main tunnels are relatively narrow (five or six feet) and quite high (eight or ten feet), and the overall extraction ratio of excavated rock to support pillar left *in situ* is quite small. The main extent of the mine has, consequently, suffered few or no roof-falls, although the some-time drift entrance and some of the small entrance labyrinth passages have fallen-in if not been deliberately blocked.

A great deal less rational than the chosen main gallery orientation, in chalk-mining terms, is the miners' practice of ending several of the tunnels with beehive-profile chambers, wider and higher than the tunnels leading to them. In other places, tunnels terminate (as usual in chalk mines) in stepped mining benches. These were the result of pilot or first-stage extraction tunnelling at what is now ceiling height, followed by progressive lowering of the floor as one or more additional 'lifts' were taken, making the tunnel ceilings now in places too high to reach.

All in all, this is a somewhat whimsically worked small-scale chalk mine, illustrating however some good mining practice alongside what virtually amounts to a self-indulgent garden folly!

There is extensive nineteenth- and early twentieth-century graffiti, with names and dates relating to the Foord family very prominent. There are traces of early twentieth-century attempts to make a visitor attraction of the place. Some of the 'beehive' chambers were once lined, allegedly, with coffin boards nailed to the walls, and inhabited by fortune-tellers on days when village fairs were held: the nails, but not the coffin boards, survive in place. One or two lurid mural paintings, supposedly the

work in the late 1960s of the late James Geary Gardner, the sometime proprietor of the Chislehurst 'caves' in southeast London, can also be seen. During World War II the Home Guard are said to have used the main long tunnel as a rifle range.

Golgotha tunnel, East Kent Light Railway, Shepherdswell to Eythorne

Our last visit for Saturday was just down the road from Eastry. Here was a chance for some of the chaps to play at trains, as we arrived at the Railway Museum, with many items of stock to explore.

There is no public access to the 477-yard tunnel, but it can be viewed from trains operated on certain days by the East Kent Railway Trust (www.eastkentrailway.co.uk). This body was formed in 1985, and has been able to operate trains between their stations at Shepherdswell and Eythorne since 1995. The Trust has owned the land since 2008.



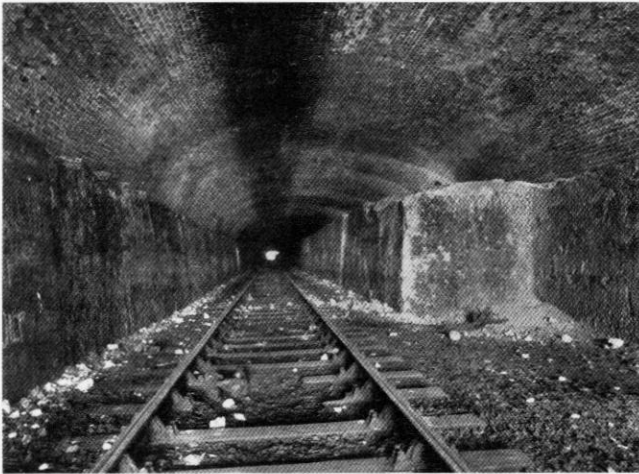
The Sub Brit group at the south portal of Golgotha Tunnel.
Photo by Martin Dixon

We were grateful to our enthusiastic and knowledgeable EKRT guide for conducting us through the tunnel – we were able to visit on foot, as the trains weren't running today. He pointed out, at Shepherdswell, the substantial mound of chalk excavated in making the substantial southern approach cutting and driving at least part of the tunnel, now a tree-covered mound close to the station. Whether the entire contents of the tunnel, as made, came out of the south end or not was not clear. Some may have been removed via one or more vertical shafts, and some taken out from the north portal. We didn't have time to go searching for possible additional spoil banks.

The East Kent Light Railway (EKLR) was constructed between 1911 and 1917 by Colonel Holman Fred Stephens [1868-1931] and was probably his most commercially successful line, with the greatest potential for remunerative freight from the east Kent collieries. It was actually built from a junction at Shepherdswell, on the London Chatham & Dover Railway (LCDR), northwards via Tilmanstone Colliery and a junction at Eastry towards Richborough, with a branch to Wingham beyond which the last station on the line was hopefully called Canterbury Road, despite being some six miles short of the cathedral city! The line opened for freight in

1911, trains at first running around the hill at Golgotha on a temporary track. The tunnel was driven from April 1912 to the summer of 1913. Passengers were carried from 1916.

The tunnel was only completed as the left-hand half (northbound) of what was to have been, had freight traffic fulfilled its promise, a single-bore double-track tunnel. Additional planned collieries at Wingham and Woodnesborough, although started, never reached production. The line was used during World War II as a base for three rail-mounted 13° inch guns. Most of the loss-making line was closed after railway nationalisation in 1948, passenger services being withdrawn in November that year. After 1951 only the Tilmanstone – Shepherds Well section remained in use. The last coal trains ran on 1 March 1984, and the remainder of the line was formally closed in 1987, the year after the colliery was abandoned.



Inside the South portal of Golgotha Tunnel – it can clearly be seen that the tunnel was intended to be twin track.

Photo by Nick Catford

The south and north portals are remarkably wide and flat brick arches. The intended completed width would comfortably have accommodated two standard-gauge tracks, if not three. I should have had a measuring tape with me! The arch is supported on stout brick side walls for some yards into the tunnel at either end, where the chalk has been excavated to the full intended width. Throughout the interior, however, such side walls are missing, and the arch rests on chalk left *in-situ*. The northwestern, or completed, half of the tunnel thus has load-bearing chalk side walls throughout its greater length, into which refuges have been cut at intervals. The southeastern half has been excavated to full brick vault width in its upper part, but a substantial volume of unworked chalk maybe eight feet or so high and wide has been left *in situ* where a second track might have been laid. Railwaymen's refuges have also been cut into this right-hand chalk wall.

We noted some of the makeshift low-voltage electric lighting, plastic spiders, and so forth, installed for special-occasion 'ghost' tours by train, or the like. Jeffrey Orbons

clambered up onto and walked along the unexcavated baulk to make an engineering assessment of the brick vault and its seating. . . or maybe he was just having fun. This very pleasant visit ended with a visit to the small EKRT bookshop and afternoon tea in their (static) refreshment coaches. We are very grateful to the Trust for the guided tour, and for opening and staffing the station's facilities for us on non-operational day.

Lydden tunnel, Canterbury – Dover main railway line, Shepherd's Well

It would have been foolish, whilst so close to the main line station at Shepherd's Well (always known thus, and not as Shepherds Well), not to have ventured onto the station platform to view the north portal of the 2369-yards Lydden tunnel, also known as the Shepherd's Well tunnel, double-track single bore, made in the years 1858–61. During construction, in 1859, ownership of this stretch of line passed from the East Kent Railway to the London, Chatham & Dover Railway.

Tyler Hill tunnel north portal, former Canterbury & Whitstable Railway, Canterbury

We returned back by coach to Rutherford Hall at Canterbury, and many members took a short walk through the University grounds to view the north portal of the Tyler Hill tunnel (828 yards) which passes through London Clay right under the campus. This – the world's first passenger railway tunnel – was part of the partially rope-hauled Canterbury & Whitstable Railway, opened in 1830. Passenger trains ran until 1930, and the line was closed in 1952.

For an element of such an important historic monument (designated Historic Engineering Work 476 by the Institution of Civil Engineers), the north portal at Tyler Hill is disappointing. Although there is a public footpath and flight of steps made down into the approach cutting, all access to the very decidedly sealed tunnel entrance is barred by high and substantial steel fencing: and there isn't even a plaque to explain the historical significance of the site, which would have cost a fraction of the sums spent on sealing and fencing!

The southern portal (also sealed), at the rear of school playing fields was viewed on an earlier Subterranea Britannica visit some years ago, and is similarly disappointing. I am aware of no traces of any intermediate spoil shafts. The tunnel itself has collapsed at some point below the University campus, although in recent years there have been proposals to re-open it and connect it to the public cycleway which runs on the 'Crab and Winkle' Line (as the Canterbury and Whitstable Railway is known locally).

An evening of entertainment

This evening was our traditional 'conference' dinner in Rutherford Hall, which everyone attended – along with a few of our guests who had guided us over the weekend – so we were indeed a big gathering.



Sub Brit member Nick Lucas giving his Bomber Harris presentation. Photo by Clive Penfold

Before dinner, Martin & Linda had set up a private room so that we could have drinks – due to the Bar being closed. This was most welcome, and proved an excellent opportunity to chat and mingle, setting the tone for a convivial evening. Dinner was waitress-served, and they even managed to put on a special vegetarian meal for your scribe. Instead of our usual after-dinner talk on the local area, we were entertained by one of the SB members attending the weekend. Nick Lucas is a professional actor, and tonight he gave us a rendition of ‘Bomber’ Harris, describing his attempts to secure recognition for his aircrews after the war, acting the part very effectively.

Sunday 6 September: Dover Western Heights, the 39 steps, and then some!

On Sunday we returned again to Dover, to the Western Heights, again in our bright orange coach. We spent the morning exploring this very large and complex site, visiting the North Entrance, followed by the Grand Shaft & Barracks site, and the Drop Redoubt. The hilltops here have been elaborated with defensive ditches, structures, and tunnels over a length of about a mile, substantial parts of the seaward boundary being the cliff-top. From eighteenth-century origins, construction dates from the threat of invasion by Napoleon. Additional work was done, in the face of another perceived invasion risk, in 1853–67.

Regrettably, the entire area is now in multiple ownership, and a modern public road has been driven through it. Much has been demolished. The southwest end of the Heights is currently in use as a closed detention centre. Most of the remainder is likewise not currently accessible to visitors, other than on special occasions or by special arrangement. The underground spaces, being unmanned most of the year, have suffered grievously from vandalism.

Such an imposing set of eighteenth/nineteenth-century structures guarding the gateway to our Kingdom deserves better than this! And Dover, having lost so many passing tourists from the ferries to the Channel Tunnel, needs all the visitor attractions it can muster to encourage visitors to the town. We are grateful to Paul Wells and others of

the Western Heights Preservation Society (formed in 2000) for their work at the Drop Redoubt, and for their guided tours.

Dover Western Heights North Entrance

We entered the north entrance to the Western Heights from the inside of the fortifications. Behind the locked door there is a capacious brickwork tunnel, built with two interior bends as a security measure. Leading off from this, on the right-hand side, there are flights of steps leading to large subterranean water tanks (with no water, but containing demolition rubble resulting from modern road-building), and rooms and defensive gun positions covering one of the two deep ditches forming part of the outer defences. At the far end, the original outer door to the fortifications is guarded by an internally-operated counterweight drawbridge, and then by (now ruinous) bridges over the two ditches. They certainly didn’t want the French dropping in for tea!



North Entrance. Until the late 1960s the North Military Road ran across two drawbridges and through the north entrance.

A defunct traffic light can still be seen on the north side.

Photo by Clive Penfold

Dover Western Heights Grand Shaft

Exiting from the North Entrance fortifications there is a long steep flight of steps, through hillside now overgrown with shrubs and trees, down to the location of the former extensive barracks, commenced in 1804, and completed between 1853 and 1867 to house 1,300 men. Of these buildings (demolished in 1985), little more than foundation traces can now be seen. However, they were used as the site for filming the 1960s film *The War Game* – including the scene where the critically injured are lined up and shot.

There is a further long flight of steps down into a cone-shaped excavation to the top of the Grand Shaft. This extraordinary structure was sunk between the years 1806–1809 to the designs of Brigadier-General William Twiss and was reputedly one of the wonders of the age. A brick-lined vertical cylindrical shaft was dug, maybe as much as two hundred feet back from the cliff edge, to allow access between the barracks and the base of the cliff near the Western Docks. Within this shaft there are three helical staircases, one inside the other. At the centre

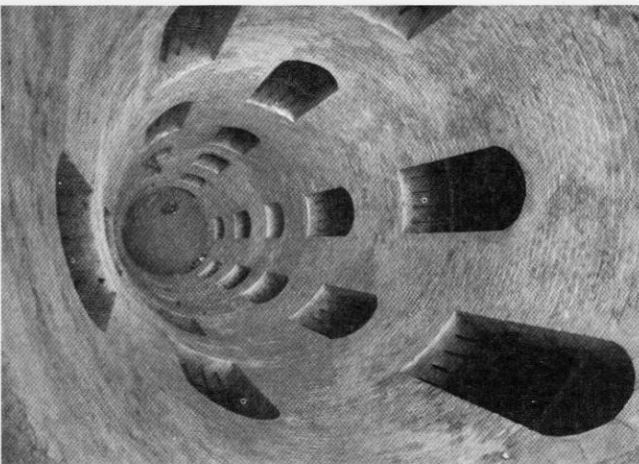


The top of the Grand Shaft. Photo by Clive Penfold

of the structure is a light well, allowing natural lighting in daylight hours. The whole thing has a diameter of, perhaps, twenty feet or so. At the bottom, a short tunnel leads out past a guardroom to Snargate Street.

Local folklore has it that one of the staircases was for officers and their ladies, another for sergeants and their wives, and the third for soldiers and their women – or some-such nonsense! It is far more likely that three intertwined staircases were seen as a means of moving large numbers of soldiers as quickly and efficiently as possible. There are several shorter examples of intertwined double helix staircases (without light wells) of similar date within Dover Castle.

The Grand Shaft has, in the past, been open to the public from time to time, manned at the bottom by somebody selling tickets. Presumably the sums raised were



Looking down the Grand Shaft. Photo by Clive Penfold

insufficient to pay the ticket-seller, and there is currently public access only on infrequent special occasions. At the top of the shaft there is a plaque commemorating the memory of a local man who did much to increase public appreciation of the Western Heights. Thanks to his efforts, the demolition rubble from the destroyed barracks was not simply bulldozed down the shaft,

Dover Western Heights Drop Redoubt

Having, by now, climbed very large numbers of steps from the top of the hill almost to beach level, and back up, we tackled the Drop Redoubt (built in 1804–1808,

and extended in 1859–64), the easternmost massively fortified position overlooking the town. Inside, of course, there are many more stairs!

The Drop Redoubt is an irregularly pentagonal mass of *in situ* chalk, forming for practical purposes a heavily defended gun platform. Surrounding it is a deep, wide, masonry-faced ditch. Attackers would have to have descended the near-vertical outer walls of this ditch, and then sought to penetrate the similarly sheer inner walls to get into the rooms and staircases around the exterior of the chalk core, or the barracks, stores, and casemates on top. Whilst in the ditch, such attackers would of course have been easy targets for men in the fort.

Subsequent to its first construction, the central fort was equipped with bastions projecting from four of the five corners, allowing defenders to shoot along the ditches. Access to this structure, when the place was manned,



Entrance to the Drop Redoubt, now without its drawbridge.

Photo by Clive Penfold

was via a defended bridge (now demolished) over the ditch on the south side. We entered at ditch floor level through a tunnel constructed during World War II. During this conflict, the redoubt was occupied by a detachment of Commandos who would have exited via this tunnel to destroy Dover Harbour using previously placed charges should the port ever have been invaded.

The interior spaces comprise the usual rooms, staircases, storage magazines, and gun positions. Spaces in the bastions have two levels of firing loops, the upper of which are reached by steps and slate slab interior balconies. These balconies call for caution, as substantial parts of the slate floors are now missing. The roof of the fort, on a sunny day, is a splendid viewpoint, and a nice place to enjoy a picnic lunch. A pathetic scrap of reputedly Roman concrete survives at the southeast corner, all that is left of Dover's western pharos.

Langdon Battery, Dover

The last programmed visit of the day was to the Maritime & Coastguard Agency's Station on the cliffs east of Dover. This is a modern building constructed on top of the early twentieth-century Langdon Battery and incorporating in its basement some semi-subterranean rooms. This establishment, naturally enough, has a splendid view across Dover Harbour, up and down the

coast, and across to France. We are indebted to English Heritage, once again, for arranging our visit – as compensation for not being allowed access to some of the other subterranean tunnels in Dover Castle due to the presence of bats.

Before exploring the underground parts of this fascinating place, we were given a quite splendidly informative introductory talk on its modern functions and on the history of the battery by Gordon Wise, followed by a guided tour. We had a view from the operations room viewing balcony, and a look at the real-time computerised portrayal of anything and everything of significance in England's moat! Sunken vessels are all there, cross-channel ferries, vast numbers of international and even intercontinental freighters, and even (on this afternoon) something like half a dozen Channel swimmers! Everything (so far as our members were concerned) stopped as we watched a Sea King helicopter land and take-off – the crew dropping in for afternoon tea!

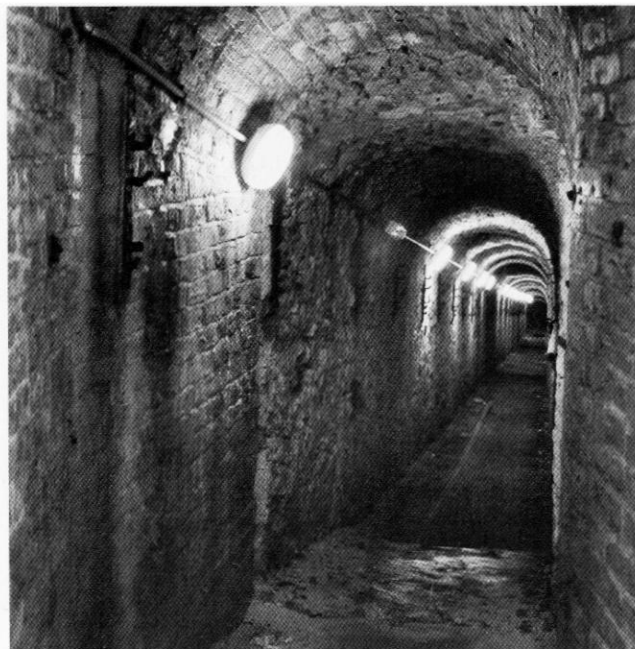


A Sea King Helicopter lands at the coastguard station at Langdon Battery; the aerial masts of the WW2 Swingate Chain Home radar station are seen in the background.

Photo by Clive Penfold

Our underground visit comprised the Langdon Battery standard ammunition storage rooms (with the remnants of one or two ammunition hoists) now in other use and we were allowed into a long sloping tunnel through the chalk dug in World War II to a now-redundant forward observation post out on the cliffs, but blocked at the far end, although there is an escape hatch. The short seaward end of this same tunnel can be accessed from the redundant post. Although this tunnel appears to have no current operational use, it is nevertheless equipped with functioning electrical lighting. It would apparently have emerged on the steep tramway which once descended the face of the cliffs from the Martin Mill area to the Eastern Docks.

Thus ended the official programme for three hugely appreciated action-packed days. Subterranea Britannica was a great deal more than fortunate to have such an ably organised long weekend, such good weather, such interesting sites, and such knowledgeable, enthusiastic, and patient guides.



Tunnel from Langdon Battery to the observation post.

Photo by Barry Stewart

And if you fancy joining next year's Sub Brit weekend of underground trips, it is pencilled in for 3 – 5 September 2010 in Cornwall. Look out for more information in further editions of *Subterranea*. Additionally you could attend the NAMHO (National Association of Mining Historical Organisations) Conference from 4 – 6 June in Gloucestershire, see www.namhoconference.org.uk.

Jeffrey Orbons is from the Netherlands, and attended with his father, Joep. He is one of the youngest ever Sub Brit members – and here is his take on the weekend – he certainly seemed to enjoy it!

I really liked the weekend in Kent. Dover castle was good. I really liked it over there. Dumpy was nice and all those other underground places were fine too. Everything that is under the ground is nice.

Then we went to the University of Kent. The rooms were very good. I slept well for those two nights. In the weekend we've been to: Dover Castle, Fort Amherst, Eastry caves, Golgotha Tunnel, Lydden Tunnel, Tyler Hill Tunnel, Dover Western Heights and Langdon Battery.

Fort Amherst was beautiful to see. They build it against the Netherlands people!

In Eastry caves there were very nice drawings on the walls and the funniest thing is that it is in the backyard of normal people so that was pretty fun.

Golgotha Tunnel was a nice railway tunnel. We've taken a group photo over there. It actually had a pretty weird shape. It was made for two tracks but they only built one. You still could build the second track but it's not necessary.

Dover Western Heights was nice especially the grand shaft that was nicely build.

I hope to see lots of Sub Brit members in my hometown of Maastricht next May when we help to organize a weekend of fun!

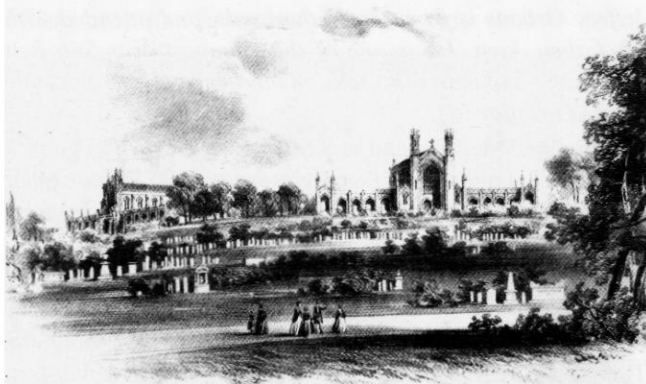
Catacombs in Britain – a Nineteenth-Century Experiment

Bob Flanagan, Friends of West Norwood Cemetery

In Christian countries burial was until relatively recently the only means available for disposal of the dead. In England most burials had been associated with churches or churchyards, some of which had been in use for over a thousand years. There were some exceptions, such as Jewish, Quaker or other dissenter burial grounds, notably Bunhill ('Bonehill') Fields in London (established by 1665).

Hawksmoor's mausoleum for the 3rd Earl of Carlisle at Castle Howard (1729–45) was a radical departure and is said to be the first such free-standing structure to be built in Western Europe since classical times. At the other extreme, urban cemeteries appeared in India (South Park Street, Calcutta, 1767), in Scotland (Calton Hill, Edinburgh) and Ireland (Clifton Street, Belfast) from the early 1770s. These themes of romanticism and functionality were first combined in post-revolutionary Paris, where cemeteries (Montmartre, Montparnasse, and Père Lachaise) were established outside the city walls. Père Lachaise was the first to open (1804). Segregated burial and ownership of the plot was offered in perpetuity to all who could afford to pay, but five-year leases for monuments and common graves were available to those who could not.

The Cemetery in England



West Norwood Cemetery in the 19th century.

Episcopal Chapel to right; Dissenters' chapel to left

In nineteenth-century England the growth of industrial centres meant that traditional methods of disposing of the dead could not cope. In London the first of the great commercial cemeteries, the General Cemetery of All Souls, Kensal Green, was opened in 1833 by the General Cemetery Company. However its buildings (Anglican and nonconformist chapels in consecrated and unconsecrated portions of the cemetery, respectively, and gatehouse/office) were not completed until 1837. The Greek Revival style was followed as in all cemetery buildings until the mid-1830s, but things were about to change.

The South Metropolitan Cemetery at the then hamlet of Lower Norwood was designed by (Sir) William Tite and

opened in 1837. Tite was not only a Director of the South Metropolitan Cemetery Company, but an advocate of the Gothic sentiments expounded by Charles Barry and by Augustus Pugin. The architecture at Norwood was Gothic Revival, the first appearance of this style in any general cemetery. This use of the Gothic was widely acclaimed and thenceforth perpetuated in virtually all cemetery buildings from the 1840s until the twentieth century and, although individual monuments derived from classical models continued to be erected until the early 1900s, Gothic tombs, Gothic details, and Gothic forms proliferated.

The South Metropolitan Cemetery



Tite designed the cemetery landscape as a unified composition with winding paths and informal layout, and with Episcopal (Anglican) and Dissenters' (nonconformist) Mortuary Chapels complete with catacombs (crypts) that could together accommodate some 3,500 coffins. There were also an entrance lodge, three entrance gates, a high

boundary wall and Gothic iron railings. The chapels at the highest point of the cemetery were the hub of the scheme. The Dissenters' Chapel was located at a slightly lower level on the hill than the larger Episcopal Chapel. Both were based on the design of King's College Chapel, Cambridge. London stock brick was used with Portland stone decorative elements and arcaded screen walls.

The cemetery was consecrated by the Bishop of Winchester on 7 December 1837, except for an area around the Dissenters' Chapel, which was allocated for nonconformists, and a reserve area that was consecrated in 1880. Provision was made not only for privately-purchased family graves and vaults, but also for pauper burials in common graves. In 1842 a small enclave was purchased by London's Greek Community. This was subsequently enlarged by further purchases, and a mortuary chapel was built in the enclave some time after 1872. This Greek section now contains an outstanding collection of monuments.

The first burial in the cemetery took place on 12 December 1837. It was of Harriet Raincock, daughter of a stockbroker who had bought a family plot for £3 3s. Sadly, the tombstone with its inscriptions of many members of her family, including her sister Sophia, an artist, who died in 1890, has been demolished by the present cemetery owners, Lambeth Council. The numbers of burials each year rose gradually, and the South

Metropolitan soon became the most fashionable cemetery in south London – known as the Millionaires’ Cemetery from the quality of its mausolea (more than 30) and other elaborate monuments.

By 1900 the cemetery was becoming largely filled with graves, and even some of the roadways were used for burials. In 1915 a crematorium and columbarium were installed beside the Dissenters’ Chapel. Sadly, both chapels were damaged during World War II, and a number of monuments were also destroyed or damaged. The cemetery lodge, only just rebuilt in the 1930s, was destroyed by a flying bomb in 1944. The Dissenters’ Chapel was demolished in 1955, and replaced by a modern crematorium. The Episcopal Chapel was demolished in 1960 and replaced by a rose garden. Nonetheless the catacombs below the Chapel still survive: those beneath the crematorium now house the furnaces, but those on the site of the Episcopal Chapel remain complete with some 2,000 coffins, unique architectural features, and a unique hydraulic coffin lift. Now listed Grade II, they are sadly closed to public access because of Health and Safety considerations.

The Norwood Catacombs

Mediaeval tradition allowed for burial in churches for those who could afford it. Thus, at Kensal Green and at Norwood, provision was made for interment in catacombs situated beneath the mortuary chapels. Of the other commercial cemeteries founded in London at this time – Highgate (1839), Nunhead (1840), Abney Park (1840, wholly for dissenters), Brompton (1840) and Tower Hamlets (1841), catacombs only featured in the designs of Brompton and Nunhead, although the famous Egyptian Avenue at Highgate performed a similar function above ground level. The Brompton catacombs, whilst still accessible, are not on the scale of those at Kensal Green or Norwood, whilst the small catacomb at Nunhead

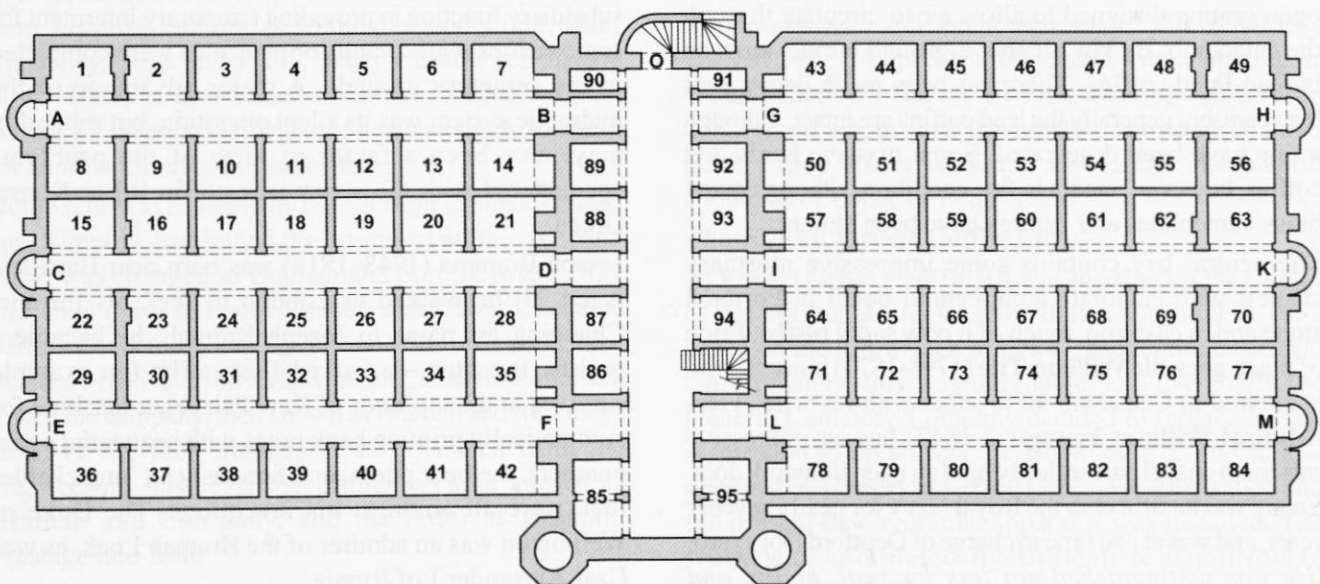


The coffin lift or ‘catafalque’ stands in the central isle. The blocked aperture in the ceiling led to the now demolished Episcopal Chapel above.

Photo by Nick Catford

beneath the remains of the Episcopal Chapel is sealed. Catacombs were of course provided in some other English cemeteries, such as those at Church Cemetery, Nottingham, built into the site of a former quarry.

At Norwood the catacombs beneath the Dissenters’ Chapel, never very popular, have been so modified as to have lost almost all their original character as they now house cremators and associated equipment. The fate of the coffins they once held is unknown. The corresponding catacombs at Kensal Green have been sealed. However, the catacombs beneath both Episcopal chapels survive. Those at Norwood consist of a series of brick vaults supported on brick walls and piers. The layout is regular and symmetrical, and consists of a tall central gallery, which corresponds to the location of the demolished chapel, and six corridors running at right angles to this gallery to the North and South that give access to the



PLAN OF CATACOMBS UNDER EPISCOPAL CHAPEL

Re-drawn by Tim Robinson from the original plan held in the cemetery office





Bays stacked with coffins in one of the side aisles.
Photo by Nick Catford

vaults. Access to the catacombs is now via an external staircase to the East end. There is a further staircase, which would have led down from the interior of the now vanished chapel above.

The six narrower vaulted passages, three on each side of the main vault, each have 7 bays on either side (see plan). Some bays contain gated vaults. Whole bays, half bays, or any number of individual loculi could be purchased and modified either with cast-iron gates, sealed, or set with stone memorial tablets. Some were simply left open – in many the remains of funeral tributes placed there by mourners are still visible. An estimated 2,500 coffins are located in those vaults and are supported either on stone shelves, on cast-iron bars suspended between the brick pier supports, or rest on the floor.

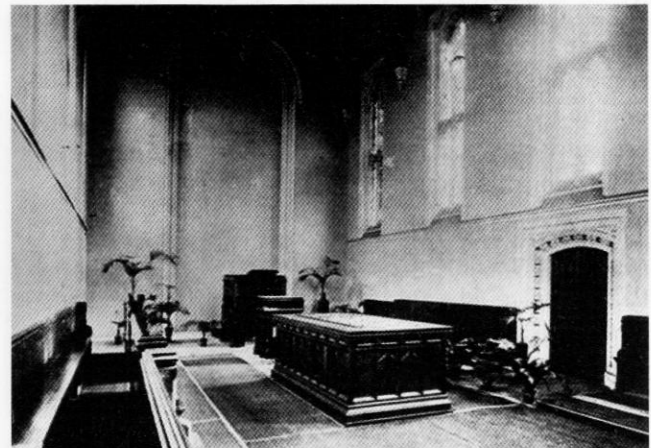
At the end of each of the vaulted passages there is an open grating designed to allow air to circulate through the catacomb. By law all above-ground burials must be in lead-lined coffins. There has been much decay over the years, but generally the lead coffins are intact, although a few have been desecrated. Some massive hardwood coffins, however, remain in fine condition, although many brass nameplates and fittings have been stolen.

The central bay contains some impressive mortuary chapels with elaborate architectural detail in Portland stone and in cast iron, much of it now sadly rusted. Pride of place goes **Sir William Tite** (1798-1873) himself, who is interred in Catacomb 90 together with his wife. **Vice-Admiral William Young** (?-1847) has an impressive catacomb chapel part sealed behind an open ironwork door. Young was an officer in the Royal Navy for nearly seventy years, and was at one time in charge of Deptford Dockyard. *'He was distinguished not less for zeal, ability and courteousness in the discharge of his public duties than for simplicity of manners, love of truth and practical*

benevolence in private life. Erected by widow and children to testify their affectionate and reverential attachment to his memory'. He was a Vice-Admiral of the Blue and lived at Denmark Hill, Camberwell. He was buried on 19 February 1847, aged 85.

Elsewhere in the catacombs are stored various items such as Victorian grave diggers' spades and the memorial plaques removed from the chapels and arcades when they were demolished, including that to Sir William himself. There is also an attractive carved wooden plaque to **Pilot Officer Edmund H(ugh) C(raft) Theobald RAFVR** (1915-1942) that records that his Hurricane fighter-bomber of 30 Squadron was shot down during 'Operation Crusader', the final relief of Tobruk, on 28 December 1942. He is buried at Halfaya Sollum Cemetery, Egypt.

The Norwood Coffin Lift



Interior of Episcopal Chapel c.1930 showing catafalque, with the top of the coffin lift visible and the doorway leading to the stairs to the catacombs below.

In the middle of the central gallery is a unique hydraulic catafalque by Bramah & Robinson dated 1839, which was used to transfer coffins into, and presumably out of, the catacombs – it is thought that the catacombs had a subsidiary function in providing temporary interment for some coffins whilst vaults or mausolea were completed in the cemetery grounds. A major advantage of the hydraulic system was its silent operation, but reliability may have been a factor in view of the problems encountered with the screw-jack coffin lift at Kensal Green.

Joseph Bramah (1748–1814) was born near Barnsley. Aged 23, he walked to London to seek his fortune. Changing his name to Joseph Bramah, he became a prolific inventor – a valved flush toilet (an example survives in the top floor of Kew Palace), a machine for automatically printing bank notes with sequential serial numbers, the beer pump, and famously an 'unpickable' lock were all amongst his inventions. The Duke of Wellington was an admirer of the Bramah Lock, as was Czar Alexander I of Russia.

Bramah had been granted a patent for his lock in 1784 and set up the Bramah Lock Company at Denmark



Hydraulic coffin lift or 'catafalque'.
Photo by Nick Catford

Street, St Giles, quickly moving to premises at 124 Piccadilly. Henry Maudslay (1771-1831) had been recruited to work for Bramah while still in his teens. Maudslay made a padlock to Bramah's design and Bramah offered a reward for anyone who could pick it. Finally in 1850, an American locksmith named Hobbs opened the lock and received the reward, after working on it for sixteen days.

Maudslay became Bramah's foreman and in 1791 he married Bramah's housemaid. In 1797, he asked Bramah for an increase in his wage to help support his family. Bramah refused, so Maudslay left to open his own workshop. In 1810 he went into partnership with Joshua Field (1786-1863) [buried at Norwood: grave 3,804, square 27 – for illustration see the FOWNC Postcard of St Stephen's (Greek) chapel – www.fownc.org], and the firm became famous as Maudslay and Field, later Maudslay, Sons and Field. Henry's fourth son Joseph (1801-1861) is also buried at Norwood (grave 4,361, square 77 – see www.fownc.org/newsletters/no50.shtml for an illustration of his tombstone).

But to return to Bramah. In 1813 Joseph Bramah's eldest son, Timothy, had joined the business and the company name was changed to Bramah and Son. Between 1821 and 1836 two other sons, Francis and Edward, became partners and the company became Bramah and Sons. Between 1837 and 1841 a new partner, Charles Robinson, joined the company, then known as Bramah and Robinson. In 1841 the lock business was separated from the engineering business; the former became known as Bramah and Company, and the latter as Bramah, Prestage and Ball.

A further important Bramah invention was the hydraulic press, hence it is no surprise that Bramah and Robinson were invited to design and install the hydraulic coffin lift

at Norwood. However, it could be that the company's work for the cemetery antedated the installation of the lift. At the base of one of the cast-iron piers of the little-used Church Gate on Norwood Road (opposite St Luke's Church) is a fragment of a plate that reads 'AMAH'. From the size of the adjacent mountings it requires little imagination to complete the name 'BRAMAH & ROBINSON'. This discovery has not been documented previously. It is clear that the coffin lift was not part of the initial plan for Norwood since the original catacomb design (illustrated) does not feature the lift. According to JC Loudon (*On the Laying Out, Planting, and Managing Cemeteries and on the Improvement of Churchyards*. London: Longman, Brown, Green, and Longmans, 1843) the cost of the lift was about £200, and it had one drawback - during very severe frosts the water was liable to freeze. This was guarded against by shutting all the outside doors of the vaults and by the use of stoves to keep the place warm.

All I have found regarding other Bramah railings is a reference to the Piccadilly Hyde Park gates being cast by Messrs Bramah and Sons (Smith, Thomas. *Historical Recollections of Hyde Park*. London, J Smith. 1836). 'They are of iron, bronzed, and fixed or hung to the piers by rings of gun-metal. The design consists of a beautiful arrangement of the Greek honeysuckle ornament; the parts being well defined, and the raffles of the leaves brought out in a most extraordinary manner'. I'm told the Wellington Arch gates are by Bramah as well.

The Hyde Park gates are now painted light green, whilst the Norwood gates and railings adjacent to Robson Road/Norwood Road are now painted 'spice' (light brown) and the railings adjacent to Hubbard Road are a shade of apple green. Both colour schemes were chosen to reflect the original paintwork as a result of English Heritage analysis of paint samples. There is a final twist – close inspection of the metalwork of the main gate at Norwood reveals a different name plate: 'GB COOPER, 121 DRURY LA', perhaps associated with a later repair to the structure – the style of the lettering looks to be much more recent than the newly-discovered Bramah plate. I have not as yet found any further information about 'GB Cooper of Drury Lane'.

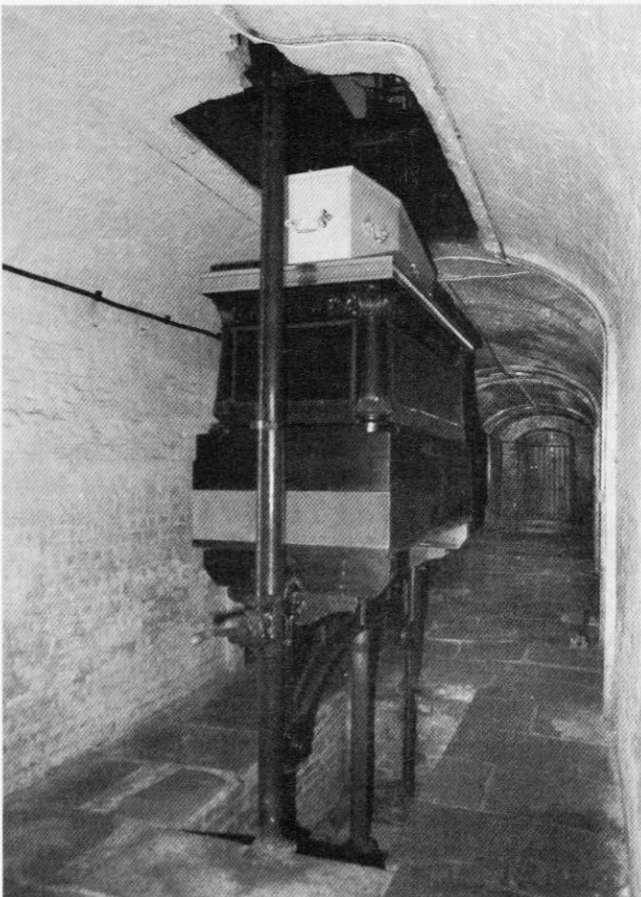
The Kensal Green Coffin Lift

At Kensal Green a coffin lift was installed in the Centre of the Episcopal Chapel soon after it was built in 1837 based on the screw-jack principle, as mentioned above. Unfortunately, this was unreliable, and eventually the General Cemetery Company decided to replace it. The inspiration to do so was the Norwood lift. The screw-operated machinery at Kensal Green was dismantled and the present-day hydraulic apparatus was installed. The work was completed by Bramah & Robinson in December 1844. The new hydraulic system at Kensal Green cost £200, whilst the original machinery cost £400 in total.



Kensal Green coffin lift in 1992, before restoration in 1997.
Photo by Nick Catford

The Norwood coffin lift differs from that at Kensal Green in that only the top of the catafalque on which the coffin is placed was designed to move, i.e. raised and lowered through the body of the catafalque, whilst at Kensal Green the whole catafalque is raised and lowered. In both cases the catafalque was designed to swivel to facilitate loading or unloading as appropriate. The Norwood lift system was obviously more economic, to the extent that it uses only one pump with one handle for



Kensal Green coffin lift after restoration.
Photo Adam J Brown (Alpha Beta Photography)

a much higher lift, whilst that at Kensal Green employs a twin pump with two handles. However, it would seem that modification of the existing Kensal Green lift to incorporate hydraulic machinery offered a more cost-effective solution than total redesign of the lift on the Norwood model.

The Bramah Archives in the Science Museum hold drawings of both the Norwood and Kensal Green lifts, the latter the subject of a splendid restoration completed in 1997. There is also a drawing of a further apparatus to be installed in the mausoleum of the Dukes of Rutland in the grounds of Belvoir Castle. I do not know if this latter apparatus was built, but I'm told there is a coffin lift at St George's Chapel, Windsor.

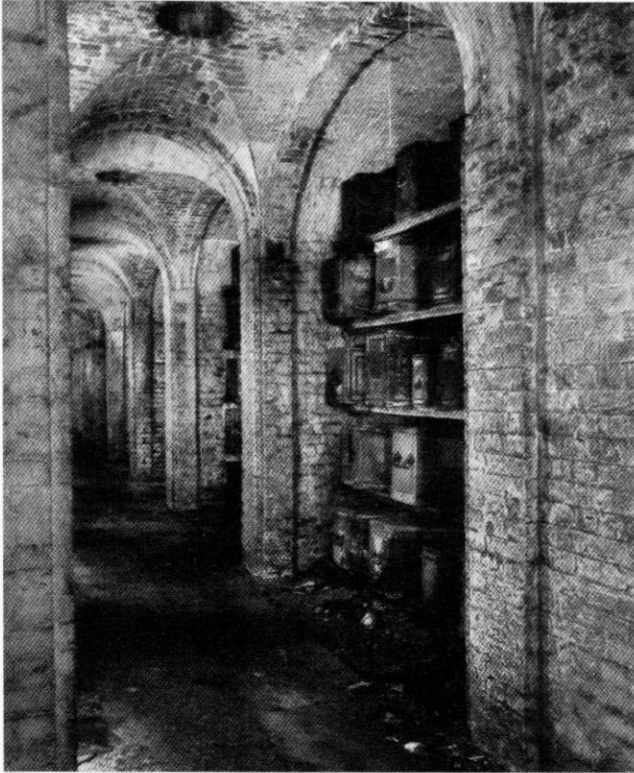
Norwood – The Future

In 1965 the South Metropolitan Cemetery was compulsorily purchased for £6,000 by Lambeth Council, using Public Health Act powers. A condition of the deed of transfer was that the rights of existing grave owners were to be maintained, and the Act of Parliament establishing the cemetery and governing its operations was never repealed. The importance of the cemetery and the quality of its monuments were emphasized in 1978 when it was included within a conservation area, and in 1981 when the entrance arch, gates, walls and railings and 44 monuments were listed (seven Grade II*, the rest Grade II – a further 21 monuments have since been listed). It has been recently been awarded Grade II* status on the English Heritage Register of Historic Parks and Gardens.



Coffins stacked in one of the bays.
Photo by Nick Catford

Despite this apparent protection in law, the cemetery was subjected over a couple of decades by Lambeth Council to a programme of 'lawn conversion'. During this period, well over 10,000 monuments were removed, ignoring rights of grave owners and keeping no proper records of



Side aisle, Kensal Green Cemetery catacombs 1992.

Photo by Nick Catford

the position of graves. Moreover, nearly 1,000 private graves were resold illegally for new burials. The destruction was eventually stopped in 1991 (by which time two listed monuments had disappeared and several others had been badly damaged), by the Archdeacon of Lambeth who referred the matter to the Consistory Court of the Diocese of Southwark (80 percent of the cemetery is consecrated ground). The power of management of the cemetery was delegated to a Scheme of Management Committee composed of representatives from both the Diocese and Lambeth Council.

As ordered in the judgment, the Council has restored/ repaired the disappeared/damaged listed monuments, and a landscape management survey has been carried out. In the past few years, a concerted effort by the Council, English Heritage and the Friends of West Norwood Cemetery has resulted in the restoration/repair of numerous monuments, as well as parts of the wall and railings; plans were in hand for improvements to the drainage system and, perhaps eventually some restoration of the catacombs. But the Council is currently aiming to undo all this good work, remove monuments, and reopen the cemetery for burials. This despite the its unique place in the history of London, and indeed in the history of British cemetery architecture. Sadly the future for the catacombs looks increasingly bleak.

Others notable catacomb interments at Norwood include

(i) **Hon Colonel Sambrooke Anson** (1778-1846). Gazetted Lt-Colonel on 15 September 1809, he commanded the 1st Foot Guards in the Peninsular Campaign, 1809-13.

(ii) **Edward Charles Mackintosh Bowra FRCS** (?-1874). One of the first British Commissioners of the Chinese Customs Service.

(iii) **Major-General Charles Alfred Browne** (1801-1866) (Catacomb 16 D), son of William Loder Browne, merchant, of Kennington. He joined the Madras Army in 1826 and was gazetted Major-General in 1862 (see www.fownc.org/newsletters/no52.shtml [for further information about the Browne family]).

(iv) **Sir George Carroll** (1784-1860) (Catacomb 11 North). Carroll was a stockbroker in 1811 and also a contractor for the State Lotteries until 1826 (when lotteries were abolished) with offices in Cornhill, Oxford Street, and Charing Cross. He was Sheriff of London and Middlesex, 1837-8 and was knighted in 1837. He was Lord Mayor of London, 1846-7, and died at Loughton, Essex on 19 December 1860. [In total there are 17 Lord Mayors interred at Norwood.]

(v) **Sir John Cowan** (?-1842) (Catacomb 36). Lord Mayor of London, 1837-8.

(vi) **John Locke** (1805-1880) (Catacomb 31 North). A barrister and politician, he was MP for Southwark, 1857-80. He introduced a bill to give witnesses in criminal cases the right to affirm as in civil cases, 1861.

(vii) **Sir Chapman Marshall** (1787-1862) (Catacomb 37). Lord Mayor of London 1838-9. He died at Pembridge Crescent, Bayswater on 9 January 1862.

(viii) **Major John George Richardson** (1786-1867). A Royal Marine, he was severely wounded in the mouth, in an arm and a leg on board HMS *Africa* in action with a Danish flotilla of gun and mortar boats while becalmed near the Malinor Channel, Sweden, in 1808. He died on 25 January 1867.

Acknowledgement

I thank Mrs Angela Li and Mr Keith Lucas (London Borough of Lambeth) for help in the preparation of this article.

Further Reading

Mortal Remains - The History and Present State of the Victorian and Edwardian Cemetery by Chris Brookes. Wheaton, 1988.

London Cemeteries by Hugh Meller & Brian Parsons. The History Press, 2008.

The Mechanical Catafalque at Kensal Green by Edward S Pepper. Friends of West Norwood Cemetery Newsletter 40 (January 2001) <http://www.fownc.org/newsletters/no40.doc>

The South Metropolitan Cemetery, West Norwood - An Introductory Guide. Friends of West Norwood Cemetery, 2007.

The Friends of West Norwood Cemetery website (www.fownc.org) has details of other relevant publications, including copies of all Newsletters back to 1994.

1 The Anglican Chapel catacomb is accessible and is included in the Friends of Kensal Green Cemetery tour on the 1st and 3rd Sunday of each month.

See: www.kensalgreen.co.uk for details

The motivation and the research into HMS Forward

Geoffrey Ellis, Secretary, Friends of HMS Forward

Thinking about it, my interest in the WW2 tunnels of South Heighton began at the age of six before I understood anything of what war was about. I remember soldiers excavating into a bank beside the road under a swathe of camouflage that I passed on my daily walks to and from school in the summer of 1941.

Halfway up the hill there was another scene of activity where more soldiers were busily engaged digging a row of four circular holes in the hillside and pouring concrete into curved corrugated iron moulds under more heavy camouflage. They used an enticing narrow-gauge railway to carry away the chalk spoil and deliver construction materials and enforcement ironwork from the nearest road at the top of the hill. (This, I learned later, was to avoid tell-tale evidence of vehicular activity across the virgin grass hillside that could draw undue attention to the site by enemy aerial reconnaissance). I must confess that I was unable to resist the temptation to join some older lads of an evening to 'ride the trams' down the hillside and leap off just as the track ended on a turntable! When all this activity ceased, a lone sentry (not always the same one) was left guarding a gate at the roadside entrance. Whilst they were happy to talk to me (presumably to break the monotony of watching the grass grow), none could be persuaded to let me see round the rather annoying bend just inside the entrance. And so it remained, week after week, and year after year, always happy to talk, but no concessions.

Came one day at the end of 1945, a colleague approached me eagerly saying, "Geoff, got a torch? The tunnel gate's open". Now at that time I was heavily into Enid Blyton's tales of the 'Famous Five' and 'Secret Seven'. This was to be my personalised adventure that surpassed anything fictional. Armed with small torches we entered the gate, turned the corner, and edged our way cautiously into the ink-black abyss of the unknown. On and on we went, with the spectacle of the entrance behind us getting smaller and smaller.

After what seemed an eternity we came across two sets of wooden stairs ascending left and right towards the surface; we decided to continue on to explore what lay ahead. Further in, the narrow adit gave way to a labyrinth of larger tunnels. What we beheld on that first journey was a sight of desecration. Everywhere we looked, earlier visitors, hell-bent on liberating the wooden battening that supported the plywood tunnel lining, had created mayhem in their quest. There were lengths of dislodged ventilation trunking, and cable tray, scattered pink and white naval message pads, dozens of rolls of manifold teleprinter paper, odd lengths of cable, and some radio components. I salvaged an abandoned three-ganged variable tuning capacitor that I used to make my first crystal set.

In retrospect it chills me to consider what might have been the outcome had our batteries run out; or our torches dropped, smashing a bulb! Further visits ensued using larger torches. I managed to rescue what I now realise were small 2-volt secondary cells that would have been used to provide a 50-volt positive battery supply for the PMBX1A switchboard. During these later visits I got to know my way around the labyrinth, and visited all five of the hillside pillboxes. However, a locked gate on one flight of stairs prevented exploration of that passage.

These imprinted memories paid dividends many decades later when I needed to impress a sceptical local historical society of the size and complexity of this hidden establishment that was fast fading into obscurity. However at this stage I was still an inquisitive twelve-year-old with a lot of learning to do and a lot of experience to gain before I could begin to understand the half of what I had seen. This was acquired with a Grammar School education, a two-year GPO Telephones engineering apprenticeship, National Service, and a series of City & Guilds passes in telecommunications, and radio subjects, and the acquisition of my Amateur Radio licence. These provided a firm foundation for a career in telecommunications that included research, planning, and administrative telecom engineering from DC to RF to digital techniques.

After several years 'in the field' gaining telecom experience 'on the tools' I was 'invited' to join 'the office' to assist with the automation of the telephone network in preparation for STD (Subscriber Trunk Dialling). One of my first duties when introduced into the local area planning office was to 'clear out' some old files from a cupboard to create more filing space. These were copies of old wartime job files, all marked SECRET, that had served their purpose and were now fifteen years or more time-expired. I could have just transferred the whole lot into the nearest wpb but curiosity got the better of me – and were they not marked SECRET? I thought that it would be better to retain the SECRET documents, and reject only the associated paperwork that referred to lists of stores and man-hour calculations that were comparatively innocuous – a decision I was not to regret, for in amongst the pink portfolios was one marked NEWHAVEN that referred to 'Supply and Installation of VF Telegraph Equipment at the Admiralty Station, Newhaven' and others of similar ilk. I carefully preserved these in the office just in case the occasion ever arose that they would become useful.

My telephone-area-wide territorial duties meant that I was able to visit any/every telephone exchange in the course of my duties. Most of these exchanges had existed pre-war, and had pencilled records relating to various

wartime installations, that had not been deleted or fully erased. Whilst the circuits were no longer extant, the evidence of their former existence provided a positive statement.

Forty years later I was declared supernumerary in the 1991 recession and offered 'Early Voluntary Retirement' (except there was NO choice). With no work to do, and all day to do it in, I decided to kill time trying to find out what I could about the old tunnel. Nobody I spoke to was interested; in fact their responses were very negative.



Guinness Trust Holiday Home (alias Denton House) in December 1992. Photo by Geoff Ellis

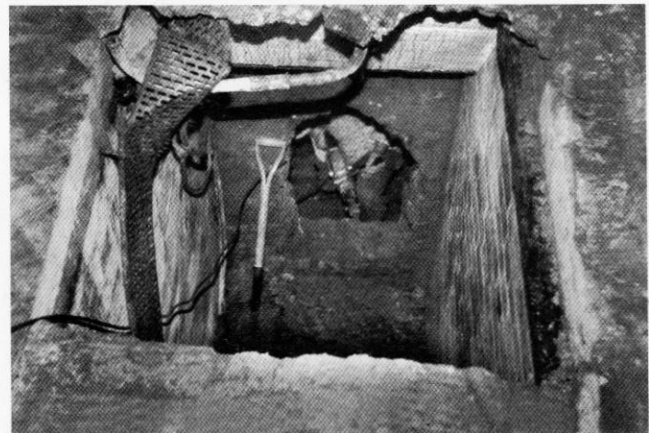
In 1992 the Newhaven Historical Society sought permission to enter the unoccupied Guinness Trust Holiday Home at South Heighton from the Guinness Trust Estates manager at Denton, wherein, we were led to believe, was an entrance to the former wartime tunnel. The manager was extremely doubtful of any such entrance, but nevertheless agreed to admit a contingent of the society to dispel any such suggestion. We took with us Ernie (Chad) Chadwick who was a Lt RN Plotter there during the war. He headed for room 16 and pointed to an area of the parquet flooring that had been removed and screeded over thereafter. We were able to knock a tiny hole in this screed with a toffee hammer. It was no more than an inch thick! This moment is captured on video.



First impressions. Rubble suspended on mineral felt membrane in Room 16 at Denton House on 10 December 1992. Photo by Peter Bailey



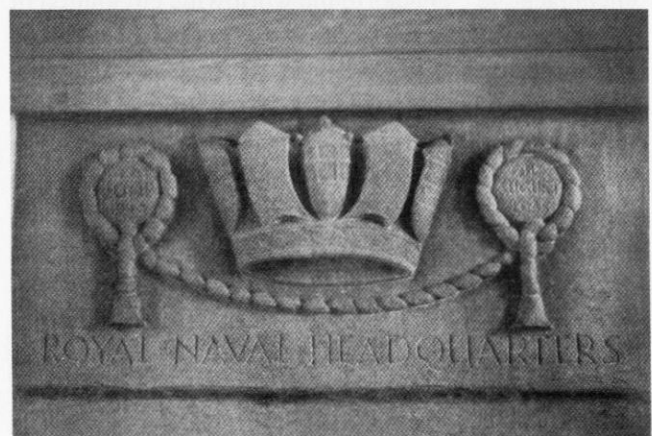
First glimpse of the solid wall behind the void on 10 December 1992. Photo by Geoff Ellis



Once through the hole with the Kango Hammer workers are able to work more comfortably. 18 January 1993. Photo by Peter Bailey

Permission to open up the entrance to gain access to the tunnels was then sought from Guinness Trust Estates Head Office. They agreed provided that no publicity was given to the fact whilst we had access.

I wrote a letter to the IWM Chief Historian seeking information about this Royal Naval Headquarters that was commemorated by a plaque in the GTHH hall. He telephoned me to tell me I didn't know what I was talking about. He lived in Brighton after the war, and had researched and written a thesis about all the military

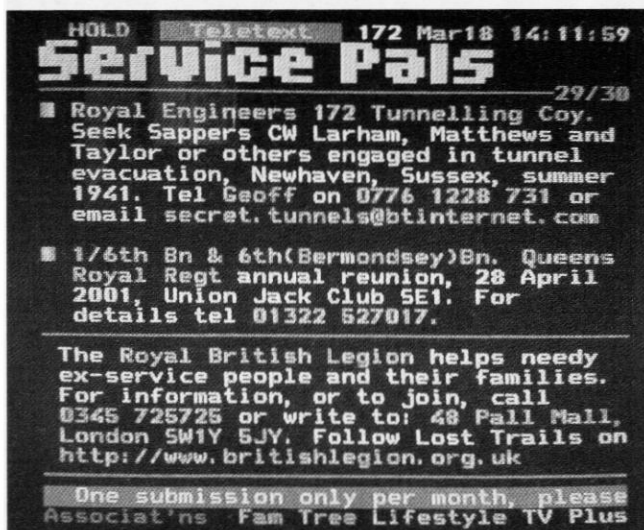


Commemorative plaque in Denton House in 1992. Photo by Peter Bailey

establishments on the South Coast. He could assure me beyond all doubt that the only tunnels at Newhaven were those at the Fort!

Now normally you can't argue with somebody who is so senior, positive and adamant – but in this case I knew differently and stood my ground. When I offered to send him a picture of the commemorative plaque above the holiday home fireplace, he mellowed and even became interested to the point of being helpful. The upshot was the discovery of three files in the PRO (NA) that, whilst better than nothing, contained little detail regarding the tunnel.

I then decided to appeal for ex-service veterans who had served there, and posted appeals for veterans in the local press, Channel 4 teletext Old Pals page, and the pages of *Yours* magazine on several occasions. I wrote to many military veterans' associations including the Wrens Association and the British Legion. In the course of four years I wrote and received some 600 letters, corresponding with some 70 veterans.



Appeal for veterans to get in touch on Teletext

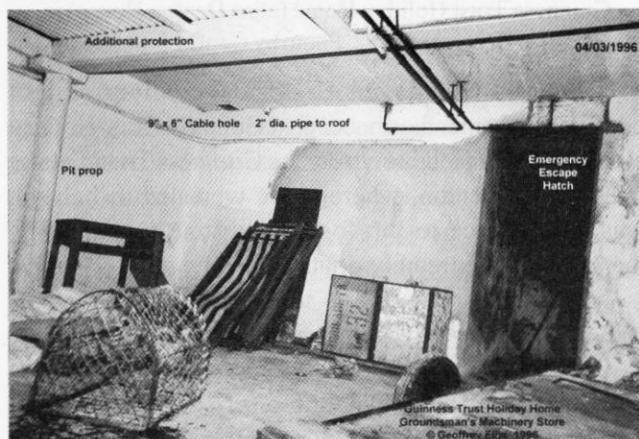
Autograph albums were very much *de rigueur* in those days. These provided a very good source of names of personnel who for a variety of reasons were 'uncontactable'. Thanks to the worldwide circulation of *The Wren* (WRNS Association publication), I received replies and artifacts from Canada, America and Australia. All my correspondence has been filed for posterity.

Only corroborated evidence was considered; this excluded one report by a Wren who wrote about a medical centre bearing the title 'Operations Room' on the door. I now consider that more is known about the conception, birth, life and death of HMS Forward than any other WW2 establishment, despite the destruction of official records. Thanks entirely to them, their revelations, photographs, and documents, we now know the details of what happened there.

Our privileged access to the tunnels through the Guinness Trust Holiday Home (aka Denton House since c.1966)

was used to the fullest extent during which time we took many photographs and video footage, and measured every room, nook, cranny, step tread and rise with a surveyors' tape and ruler to create as accurate a plan as possible. We were then able to resolve the room allocations from correlated veterans' correspondence. Return visits were made at frequent intervals until March 1996 when further Guinness Trust Holiday Home access to the tunnel was denied us because the threatened reordering was about to start.

Whilst I was given the key to the GTHH whenever I requested it, and had to the best of my ability searched the place through from roof space to basement many times over, I could never discover to my satisfaction how some external telephone cables (that were chopped in room 16 after the war) made it to the outside world. That was a complete mystery. There was one place I had never visited because I was told it was only a groundsman's store containing grass-cutting machinery, and it was independently locked. On the day of my final visit I noticed the contractors had broken into this store and left the doors open, so just to satisfy my curiosity, I had a look inside.



My first impression was of a room full of pit props. When I realised the pit props were supporting some large RSJs against the concrete roof, my suspicions were confirmed. I was looking at what is termed 'protected accommodation'. Sure enough there was an escape hatch, cable holes and the ends of two salt-glazed cable ducts poking through the wall that lined up with a footway box (small manhole) in the pavement beside the road some 50 yards distant. This is what I had searched in vain for, for three years! This store had been a switchroom prior to the opening of the tunnel. The store was completely demolished early during the reordering; but the two glazed pipes remain in the footway box. Pure serendipity.

Serendipity has played a large part in my revelations; particularly in the acquisition of the original RE plans. During the early 1990s, Lt-Col. Dennis Day RE had visited Newhaven with his daughters many times unsuccessfully looking for the tunnel that he had excavated as a 24-year-old Lieutenant. In desperation

his daughters sought the assistance of Newhaven Library in their quest, but they were unable to help. They recommended Peter Bailey, Curator of the Newhaven Local & Maritime Museum, who in turn gave them my contact details.

One evening I received an appeal from one of his daughters that they wanted to do something special for their father's 80th birthday – could I help? To cut a long story short, a meeting took place on 5 November 1997. I recorded an interview with him, and then took him to see 'his' tunnel entrance – after which he quietly turned to me and said, "You know son, I've got my original plans of this place at home – are they any good to you?"



Preparation for fitting the new gate in March 2000.
Photo by Geoff Ellis

It wasn't always good news. An army lorry driver who wrote to tell me he had delivered materials used in the construction of the tunnel enquired what else I wanted to know; he seemed to be a potentially valuable source of information with details of what he delivered, and where he got it from. The reply I received in response to my letter came from his widow to say that Harry had suffered a massive heart attack over the weekend.

I was able to supplement these revelations with my own impressions gained during my early visits, together with some unique pillbox photographs I took in 1964 before the hillside above the tunnel was developed into a housing estate c.1970 and a collection of artefacts and wartime

records discovered during my territorial GPO/BT days that I preserved out of personal interest.

Publicity in the windows of Newhaven Local & Maritime Museum caught the attention of several former WRNS and ATS who happened to visit Paradise Park (where the museum is co-located) on a Mystery Tour!

Two former GPO/BT associates, Len Miller and Dennis Thompset with whom I worked during my 40 years with 'the firm', surprisingly admitted that they were local linesmen at Newhaven during the war, and had tales to tell that feature in my video. I was totally unaware of their wartime service before I retired. Another, Syd Sayers, held a special AMES (Air Ministry Experimental Stations) Pass, visited the tunnel whilst it was under construction to specify exactly where he wanted the telephone cables to enter. He provided a wonderful pen



AC plant room. Photo by Nick Catford

picture of having to stand aside in the narrow adit whilst the young RE Sappers rushed past pushing trams full of chalk spoil towards the entrance. Reference to Lt-Col Dennis Day's progress-marked plan indicated this visit would have been in August 1941.

Thanks to those veterans that replied I now have the whole story of the establishment from the initial Admiralty Directive in March 1941, through Col. Foster RE who designed the place in May 1941, Lt. Day RE of 172 Tunnelling Coy who built the place in June/November 1941 (and gave me his original drawings marked up with weekly progress together with his end-of-job summary of every statistic imaginable – man-hours, materials, machinery, etc) and RE 577 Coy that fitted out the establishment between October and December 1941. I now know the allocations of the various galleries, the equipment installed, some corroborated anecdotal information, together with some recorded video interviews with ex-veterans.

If that was not enough, my attention was drawn by the manager of Newhaven Fort to a series of eight official

(unidentified) photographs taken by a Lieutenant Tanner on 2 October 1941 and held in the Imperial War Museum. They were endorsed as relating to “an underground operational control centre under construction somewhere in the S.E. Command. Most of the troops working here were miners in civil life, and are therefore quite ‘at home’ on this particular job.” Copies of the prints have since been positively identified as pertaining to this site. They have provided yet another source of evidence of inestimable value, showing members of RE 172 Tunnellers at work at various locations throughout the tunnel that day. Each picture is truly worth a thousand words.

I contacted the Royal Commission on the Historical Monuments of England with the geographical coordinates of South Heighton enquiring about any post-1942 aerial



WRNS in the Forward plotting room in October 1941.

Photo by Lt. Tanner

photographs they could provide, and received a computer printout of some 96 hits that matched my requirements. This provided an excuse for a caravan holiday near Swindon to visit Kemble Drive, and was well worth the trip. I was able to choose from a large selection of views (vertical and diagonal), and eliminate the cloud-occluded shots before deciding where to place my money.

It was never my intention to publish my discoveries, but the story of how that came about is another story in itself. A taxi-driver associate spilled the beans of my ‘project’ to one of his ‘fares’ (probably hoping for a larger tip). He knew his ‘fare’ was a local freelance reporter. I was unaware of this and totally unprepared for the outcome. The news made the front-page lead article with banner headlines. I was reported as stating that I had found all manner of equipment, radios, teleprinters, etc. – all untrue, of course. I wrote to the editor asking why, if he had such a vivid imagination, did he not let it stray a little bit further and say I found veterans down there waiting for news of the end of the war?

Anyway, on the credit side, the paper caught the attention of local history publisher Steve Benz who pleaded with me to write a book about all my revelations. Me? Write a book? You must be joking! He discovered that I had video footage of veterans. So why not complement the book with a video? At that point I became embroiled with finding out how. Fortunately I had a friend with a professional video studio who helped me out.

To cut a long story short, the book and video were eventually published in October 1996, just in time to hit the Christmas market. The first printing was sold out within the month, and a second printing was made. The book made an ideal present for war veterans, and in next to no time I received a number of letters from former WRNS and ATS who had served here, wanting to tell

me more, all of which contributed to a revised edition of the book being printed in 1998.

Of course, the downside to all this is that there are other people who want to copy and use your material for their own publications weaving their own fiction into their stories to add embellishment. One such ‘copier’, well-known for printing misleading misinformation, wrote to ask me for permission to use 24 of my pictures in a book he was producing – my response was less than polite.

In 1999 I managed to convince the Promotion of Newhaven

Committee of Newhaven Town that HMS Forward could become a tourist attraction for Newhaven. A group called The Friends of HMS Forward was convened and a £400 grant applied for from Newhaven Town Council to design, construct and fit a new gate on the tunnel’s western portal. At the same time we applied for a £2300 grant from The Millennium Awards for All commission to finance the administration of The Friends. We obtained permission from the owner of the tunnel portal to knock down the masonry blocking the entrance to the tunnel and fit a gate for a limited period, and then obtained assistance from the Community Service department to remove some two or three tons of earth and rubbish that had been placed to dissuade casual access to the tunnel portal.

The gate was duly fitted at the end of March 2000. This restored access to the tunnel that had been lost with the reordering of the Guinness Trust Holiday Home in 1996. The tunnel floor was searched for remaining evidence, cleared and made safer to walk on; this reduced the humidity in the tunnel. Many hardboard WW2 artifacts



Preparation for fitting the new gate in March 2000.
Photo by Geoff Ellis

(room labels and D-Day beaches mapping) were discovered in the process; these provided further corroborating occupancy evidence. Some 3300 dangerous galvanised iron wire twists (left hanging on the walls when looters liberated the wooden battening) were removed as they were deemed a hazard to firemen's breathing apparatus suits should they be called upon to enter the tunnel in an emergency.

In 2003 English Heritage carried out a pinpoint digital survey that revealed the freeholds above each part of the tunnel. All property owners concerned were invited to a meeting in the village hall on 27 May 2004. Only 66 percent attended, and half of the attendees didn't return after a break for tea. Those that stayed were informed of our offer of an obligation to maintain support for their properties in return for a 999-year lease at nil rent, subject to a 100 percent uptake, that would enable FHMSF to qualify for a HLF grant towards restoration costs. This would also absolve them from extra insurance premiums on their property and help restore their property equity values.

In November 2005, a Property Lawyer working with *Faegre & Benson LLP*, who was assigned to FHMSF under the ProBono scheme, undertook a comprehensive land survey of the territory occupied by the tunnels and confirmed that (a) the tunnels have never been registered with Land Registry and (b) under English Law, property owners own everything beneath their property, and as such are responsible for their care and maintenance of their part(s) of the tunnel whether or not they are mentioned on their deeds. As such they are perfectly within their rights to deny access to their property. In his opinion those proprietors who declined our offer had failed a unique opportunity and had not acted in their own best long-term interests. They had also let down their peers and neighbours.

The manuscript of my book is regularly maintained to keep it reprint-ready. I plan to republish my book shortly

to take advantage of the current rise in WW2 historical interest and reduce the prices my books are fetching on E-bay! Watch my website for further information.

The history of HMS Forward is in many ways unique. It was excavated and used in total secrecy, and abandoned following the cessation of hostilities. Since then, save for countless inquisitive visitors on exploratory (or witless vandalism) missions, it has retained its mysteries. The MOD destroyed 99 percent of the records about the place following the 30-year rule, as I discovered back in 1992 when I first decided (for purely personal reasons) to try to find out something about the place that had intrigued me since the 1940s. The fact that it was never modified for Cold War usage means that it remains a rare contemporary site.



Machine-gun post seen from the east stairs.
Photo by Nick Catford

Until such time that there is a change in attitude by the tunnel's owners, there is little that can be done to retard the rate of deterioration. What is certain is that the tunnel is not going to go away. The superstructure will inevitably deteriorate to a condition where it will become unsafe to enter; already there have been a number of instances of subsidence that have cost many thousands of pounds to rectify.

Fortunately the story of HMS Forward has now been revealed in great detail, and has been recorded in print, in video, exhibits in Newhaven Local & Maritime Museum, and a website www.secret-tunnels.co.uk.

This article is dedicated to the crew of HMS FORWARD who wore headphones, not helmets; who brandished Morse keys, not machine-guns; who used teleprinters, not torpedoes; despatching bulletins, not bullets; and who contemplated the courses of clandestine convoys in secret silence.

They too contributed to the Defence of the Realm and the winning of the War.

A brief history of HMS Forward written by Geoffrey Ellis together with a full photographic survey appears on the Sub Brit website.

www.subbrit.org.uk/sb-sites/sites/f/hms_forward/index.shtml

Loos I have known

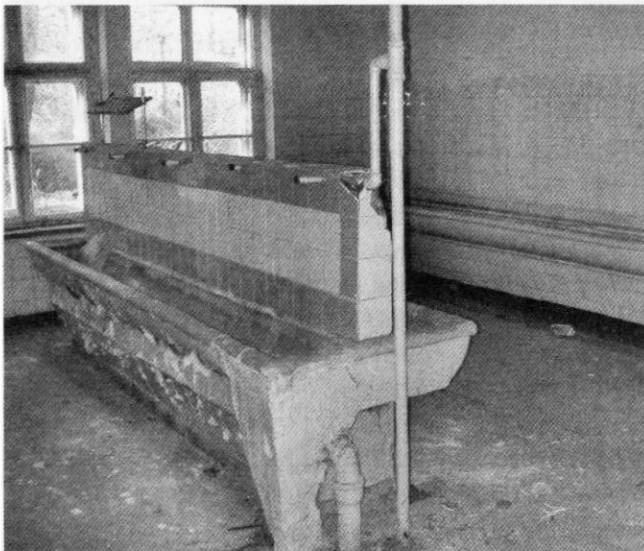
Mike Barton

Apart from a passing interest in chunks of concrete located below ground, I have also been attracted by Loos, Soviet, Military for the use of. Note: my psychiatrist has informed me that this is something that I will grow out of once I get older – such a fascination is grouped with an over-developed interest in danglies and certain bodily functions.

When making my precarious way through said bunkers (and surface building), I was soon struck by the wide range of toilet facilities which the Soviet authorities had kindly provided for their temporary employees, viz. conscripts, as well as for their officer corps since, apparently, they all do it the same way over there.

At the lower end of the scale one meets the lonely wooden cubicle located some way apart from the nearest military building on a radrel site. Since the sites themselves are normally to be found out in the sticks, the chances of an underground link to any kind of sewage system are highly unlikely. As a result, the cubicle is normally positioned over a deep hole which, for fairly obvious reasons, is of a smaller diameter than the dimensions of the cubicle. This hole in turn is guarded by a subunit of the Soviet air force, i.e. Flies, Military, Persistent, Numerous.

Staying with buildings, let's now take a look at the surface accommodation of the soldiery to be found in normal Soviet barracks. Here we find brick buildings, some 40 m long and perhaps 20 m wide, with two floors in toto. Such a building provides accommodation for two companies of conscripts, about 120 – 150 soldiers all told, ie 60 – 75 on each level for those who are mathematically challenged. The contents of one company sleep all together in a communistic manner in one room, normally on bunk beds and with a small locker for their personal belongings. Each floor of such a building includes two rooms: one for ablutions, where the soldiers can ablute using 6 – 10 wash basins or a trough, the other for the



Ablutions

bodily functions mentioned previously. Note: showers are really not on in such a society, so the squaddies march off to a *banya*, the communal bath-house, once a month for an appointment with the unit scrubber.

The cubicles in such barracks are far in advance of those found at radrel sites, being of the Mark XIII type, ie roomy cubicles with swing doors and a large porcelain slab on the floor with the moulded imprints of two booties to assist those from the wilds of Siberia and the outskirts of Moscow in perfecting their aiming techniques since they are required to target unseen a large hole in the centre of the porcelain slab.



Toilet

Mark XIII cubicle is really quite spacious so you are given the option of trying to move to the back of the bootie marks, with the inherent risk of missing your target area, or of maintaining your squatting position using your strong thigh muscles (please don't get me started!). The latter position is a high-risk scenario for those of weak thighs or for those who have consumed large quantities of alcohol in the West or vehicle anti-freeze if you were serving in the Soviet army (I gather the KrAZ anti-freeze from 1985–1988 was always highly recommended, not quite DOC, but very palatable).

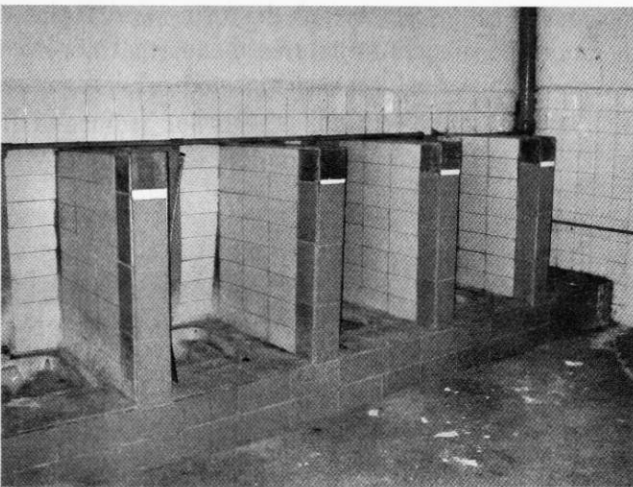
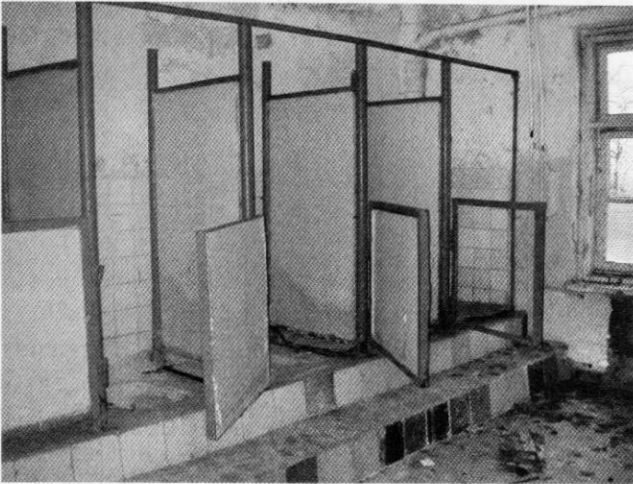
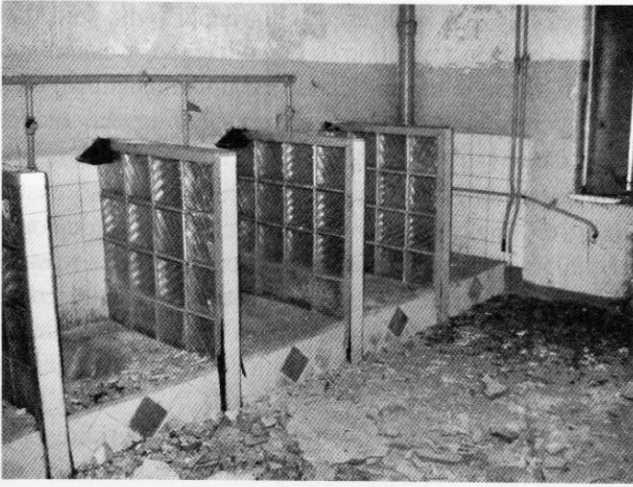
Hygiene was very high on the list of Soviet requirements: economy-sized containers of loo cleaning liquids were often provided – the photo shows a tub of chlorine.

Depending on the suspicious nature of unit officers, the cubicle may or may not have had doors. If so, the doors were also often so low as to be of no value whatsoever.

This procedure, familiar to all visitors to India, necessitates the operative adopting a squatting position for a variable period of time. He is assisted in a rocking train in India by having only limited space so that he can wedge his back against the wall (one is not actually advised to touch anything with one's hands). The Soviet

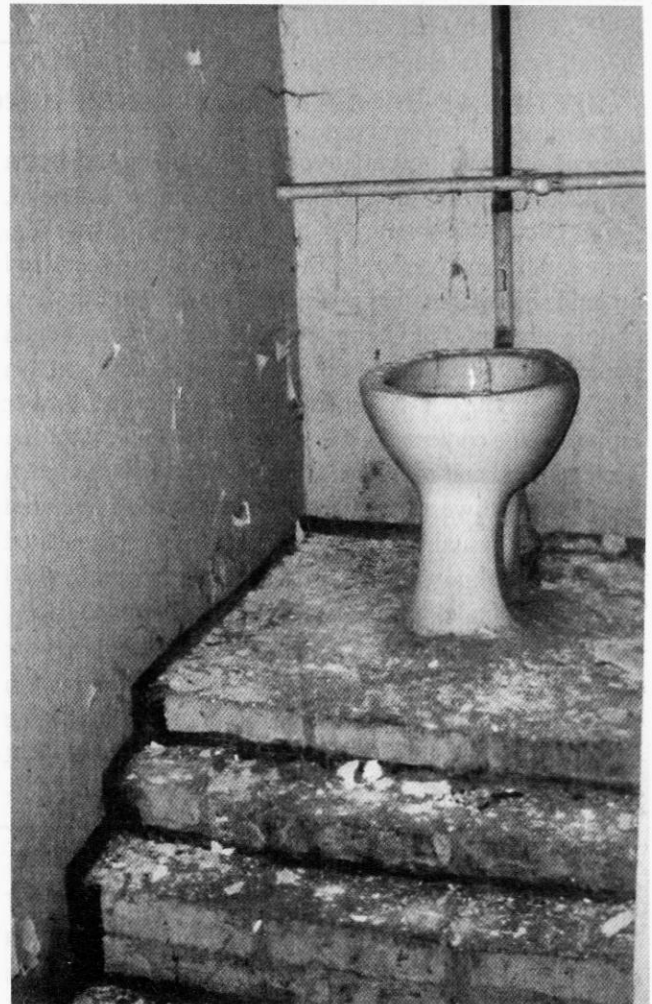
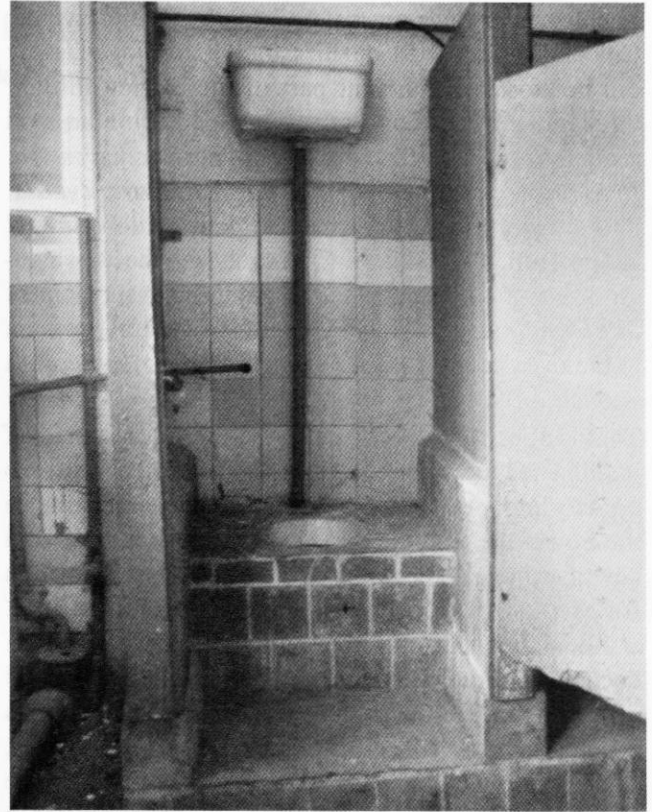


Toilet



Toilets

The Mark XIII didn't necessarily come with a flushing system, so one presumes there was some kind of gravitational slope to hasten the goodies on their way. Consequently, it was always advisable to find a cubicle at the top end of the said slope. Later models (Mark XXVII and after) were provided with a flushing system. Toilets of the quaint western fashion were generally only to be found in bunkers where the presence of senior officers was to be expected. This was also due to the common thigh-wobble syndrome which such officers often suffered from due to a bulging girth higher up.



Toilets

(Depending on seniority, some of the officers were provided with a throne at the top of a flight of steps)

Supplementary aids, such as Toilet Paper, Multi-layered, Colours, Various or Magazines, for the Reading of, sadly did not form an inherent part of the Soviet military environment. Instead, one was obliged to be an avid reader of such top-notch newspapers as *Izvestiya*, *Pravda* and even the military rag *Krasnaya Zvezda*, thus gaining you not only brownie points with your unit political officer, but also providing you with sheets of high-gloss, non-absorbent paper for use at the relevant moment (the monthly trip to the *banya* was also a useful occasion to remove the black print smears from your *derrière* – a very cleverly thought-out system!).

This lack of toilet paper provided a unique source of intelligence for western agencies in the form of the three military liaison missions operating in East Germany: since the Soviet boys had little chance of getting hold of a newspaper once they were out in the field playing soldiers for weeks on end, they had to find a substitute. Fortunately for us, this was normally in the form of documents or maps stealthily removed from the company office in the field. Evidently, classified documents provided a better wipe than non-classified bits of paper, so the Missionaries took to raking over vacated exercise areas, concentrating in particular on the toilet centres in

order to recover such used toilet paper (who said that Int work wasn't exciting?). Once bagged, washed and ironed, these maps and classified documents provided highly relevant information concerning the recent exercise.

Soviet buildings and maintenance attitudes also cast a light (or smell?) on Soviet toilet customs. A personal acquaintance was part of a work force required to strip fittings from a former Soviet airbase at Koethen near Magdeburg in East Germany. They were working in the kitchens and noticed a bricked-up doorway. Since it was not apparent where this room could have led to they decided to break open the doorway as the building was due to be demolished anyway. After working on the brickwork for some time they finally managed to break through it to discover that the room had been used for a long time as the "reservoir" for the toilets up on the next floor. Evidently, the plumbing had failed there and rather than pay for "unnecessary" repairs just before they were due to be withdrawn, the unit maintenance personnel had simply diverted the regular deposits through the system into the room below, having previously bricked up the doorway. Flexibility is everything!

Rare timber-lined Air-Raid Shelter uncovered in Downend, South Gloucestershire

Recent archaeological investigations, by the Avon Archaeology Unit, on a development site at Downend, South Gloucestershire, seeking a possible Roman villa, surprisingly uncovered the traces of a rare timber-lined air-raid shelter, possibly pre-dating World War Two by a couple of years. The shelter consisted of a zigzag trench together with its sloping approach, and was adjacent to a former school. It was cut into the subsoil with timber lining and the contents included bases for chemical toilets. Timber-lined and roofed shelters such as this are known from the northwest of Spain, the zigzag being intended to minimise casualties upon a direct hit, but no excavated examples are known from Britain. A military button and an enamel plate were recovered from the trench.

Despite popular belief that Britain was unprepared for war in 1939, regulations for air-raid defence were put in place shortly after the Munich crisis of 1938 and the present example may date from this time. It is likely that

many other examples are present in the UK but their ephemeral nature and the fact that many were replaced by more permanent structures means that no other examples appear to have been reported. A full report on the shelter is currently being prepared.



Due to the high volume of articles submitted for *Subterranea 21*, we have been unable to publish everything in this issue; this includes Robin Woolven's second article on UK shelter policy in WW2.

All articles held over will appear in *Subterranea 22*, which is due to be published in May 2010.

As a bonus, it is intended to publish a *Subterranea Special* in March 2010 devoted to the Central Government HQ (Burlington) in Corsham, Wilts. This is planned to feature a full-colour centre spread and many previously unpublished photographs.

Bunkers as Art? A New Exhibition at the Barbican

John Beckerson

For me, one of the main pleasures of visiting bunkers is not to gather facts. It is to reflect on history and human nature and to admire the harsh beauty of places built in our darkest hours.

Of course, to most Sub Brit members, the idea of bunkers as beautiful, even artistic, is entirely reasonable! But for any who have yet to be convinced, let us take this thought a little further.

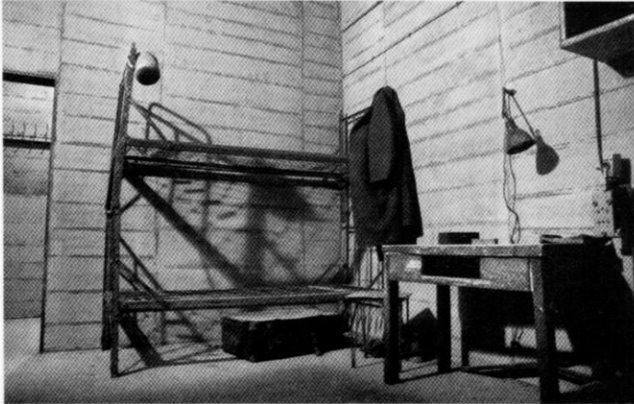


Photo Eliot Wyman - Courtesy Barbican Art Gallery

Throughout history, ruin and decay have been potent spurs to the imagination. So has the art of war. Think of the beauty of the samurai sword, the craftsmanship of the medieval suit of armour, or the wistful charm of a once great castle now in ruins. Then think of the darker appeal of Piranesi's imaginary prisons, or Doré's engravings of Victorian horrors. There is beauty in darkness, and perhaps it even helps us face our fears.

To remember, and to reflect on what might have been, is part of what makes us human. It is also a way of making sense of our past. To recall how near we came to nuclear annihilation is a topic that attracted many artists during the cold war and the echoes of those days still ring through European culture. Nowhere more so than in the former Soviet bloc.

These memories have spurred Polish artist Robert Kusmirowski to boldly create an entire bunker in London's Barbican Curve art gallery, to immerse visitors in the experience of conflict and darkness that such places exude. Kusmirowski has turned The Curve into a replica (or I would more realistically say a good evocation) of a World War II era bunker. It is a hybrid of the artist's imagination, personal memories of actual places, and of places seen in films and photographs.

Kusmirowski's works often respond to the charged historical circumstances of the places where he exhibits. For Bunker, he draws on the Barbican's concrete architecture and its location on a site devastated by bombing during World War II. The Bunker is deliberately ambiguously situated in Central Europe. Derelict industrial machinery, discarded paraphernalia and the fragments of signage in the space suggest German and Soviet

influence, alluding to their political and military presence in wartime Poland.

Kusmirowski's installations, structures and objects delve into the personal and collective past, unearthing complicated histories and questioning memory. In his other recent project The Collector's Massif, 2009 at

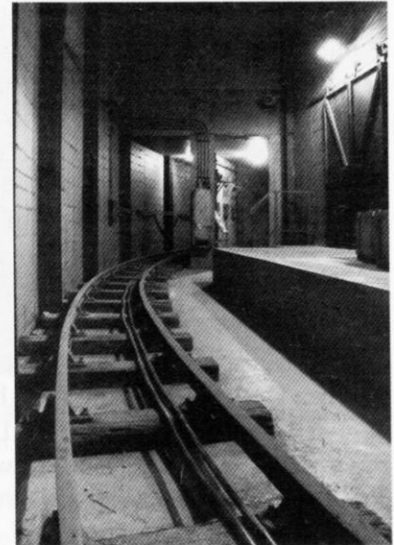


Photo Eliot Wyman
Courtesy Barbican Art Gallery

Bunkier Sztuki in Krakow, Kusmirowski displayed his vast inventory of objects from previous installations alongside a private collection of toys. At the New Museum in New York, he constructed Unacabine, 2008, a replica of the remote cabin in Montana where Polish-American terrorist Theodore Kaczynski conceived his mail bombing campaign against universities, airlines and other companies.

For those of us lucky enough to live in countries where the need to shelter from bombardment is part of our past, 'Bunker' is a reminder. For those who still need shelter, it could be more of a challenge. I wonder what a modern Iraqi, or a Bosnian, would make of it?

Of course, for those with knowledge of real bunkers, little technical problems with 'Bunker' are easy to spot. The presence of theatre lighting controllers, albeit masquerading as bunker electrical switchgear, is but one. The nature of railway access to underground sites makes the railway area technically a little suspect. Some of the high-voltage cables also do rather improbable things, such as run along the centre of railway tracks.

But to worry about such matters is to miss the key point of this artwork. 'Bunker' strives to offer the gallery visitor a sense of what many Sub Brit members have spent entire lifetimes exploring and opens the mind to the dark romance of subterranean thoughts. Visit and judge for yourself at the Barbican Curve Gallery, until 10 January 2010.

Find out more:

www.barbican.org.uk/artgallery offers photos, extensive construction details and even the bunker builders' day-by-day blog.

Opening times:

Daily 11.00am – 8.00pm

Late opening on Thursdays 11.00am-10.00pm

In Latvia, Facing the Western World...

by Tim Robinson

For me, SubBrit has been a relatively new experience compared to many of my travelling colleagues. Once I'd established that concrete and blast doors were my thing, I've strived to get on as many trips as possible but always had in the back of my mind a sort of 'holy grail' site that I never thought I would see. I'd spent many a happy hour gawping at the images of the Russian Missile Museum in the Ukraine (<http://englishrussia.com/?p=2863>) and wondering how easy it would be to get there...

Like so many trips, they often start with a simple question so when Outlook pinged to say I had a new email titled "Latvia-Lithuania Missile Silos", I couldn't quite believe my eyes. It was from Dan – to whom this write-up is dedicated later – and said:

"Here are the proposed sites for the Latvia-Lithuania missile silo tour.

Looks like fun! Interested . . . "

I loaded the attached Google Earth file and zoomed in to see what was there. The resolution wasn't fantastic but you could make out domes, hard-standing and buildings. Photos in GE gave a much better flavour and that was enough for me to send back a "yes".

Fast forward to June 2009 and I was heading for Stansted to catch another early-morning flight destined for Riga. The group consisted of myself Tim Robinson, Dan McKenzie, Gavin Saxby, Steve Underwood, Bob Clary, Nick Catford & Richard Savage. Dan had also invited Martin Trolle (www.flickr.com/photos/martintrolle/) who has been visiting, studying and recording these sites for years and would be able to give us the detailed background information on what we were looking at.

Martin was due to meet us at Riga airport having got a similar early-morning flight from Amsterdam. As I drifted off to sleep on the plane I wondered if this was going to be the 'holy grail' trip...

Day One

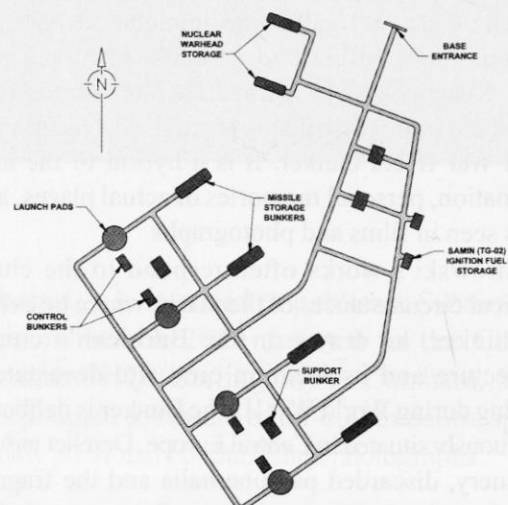
On our approach to Riga we were tempted with the sight of a small air museum on the boundary of the airport taxiways. Clearly visible were the red stars of Soviet aircraft and what appeared to be a Backfire or Tupolev TU-22M nuclear bomber. Descending the steps we had a perfect view of the collection and immediate discussions began about visiting it before we headed home. However, before that we had the small matter of finding some missile silos in the Latvian and Lithuanian woods!

Martin's flight was on time and we duly piled into the Mercedes minibus and set tomtom to find site number 1, an R-12 / SS-4 surface launch base about 36 miles south near the village of Lecava. Without some background information these missile names won't mean much so I digress for a moment or two...

The R-12 was named the SS-4 Sandal by Nato (SS = surface to surface, 4 = fourth 'SS' missile) and was the Soviets' first strategic missile that used storable propellants and a completely autonomous inertial guidance system. It was a single-stage rocket – 72ft long and 5.5ft in diameter – with a separable single re-entry vehicle capable of delivering a megaton-class nuclear warhead over approx. 1250 miles. The propulsion system consisted of four liquid-propellant rocket motors with a common turbo pump unit. Flight control was carried out with the help of four carbon jet vanes located in the nozzles of the rocket motors. The autonomous guidance and control system used centre of mass normal and lateral stabilization devices, a velocity control system and a computer-assisted automatic range control system. It was initially a surface-launched missile but later versions were adapted for silo launching, designated the R-12U. An attempt at a railway launching version was investigated but eventually abandoned.

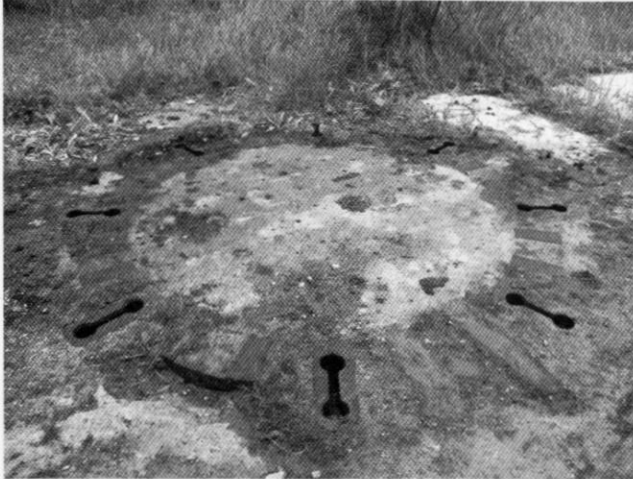
The rocket had been developed in 1955 with testing taking place from mid-1957 through to the end of 1958. It was added to the Soviet arsenal in 1959, went on alert with the first five regiments mid-1960 and eventually shown in public at the end of 1960. In September 1962, 24 launchers were famously deployed to Cuba sparking the Crisis. By mid-October, 20 were ready for launching although the Soviets claimed the missiles were never mated with the warheads.

Reaction time was assessed by the West as being between one and three hours in normal conditions and between three and five minutes in a state of high alert. It could remain in this state for many hours further increasing its potency. Between 1964 and 1966 there were some 600 missiles deployed but two years later they began to be phased out in favour of the mobile ground-launched SS-20 system.



TYPICAL R-12 / SS-4 SURFACE LAUNCH MISSILE BASE
Redrawn by Tim Robinson from an original plan by Martin Trolle

As we arrived at the base entrance, the usual Soviet-style wall could be seen disappearing into the trees and there were plenty of surface buildings and impressive murals which we would come back to later. There seemed to be no issue of driving around the base which was good as it was huge and meant we'd have not seen all that much! Martin explained that the launch and support areas were built on a common plan with just a few changes based on local conditions. A typical plan can be seen on page 52.



Lecava R-12/SS-4 base, rocket firing ring.
Photo by Tim Robinson

Our first stop was a launch area which despite the base closing during the mid-80s had not been taken over by nature. The ring where the firing table and deflectors for the jet blast were fitted just had a light covering of dirt! However, nature had got the better of some of the adjacent support/technical buildings and all had been visited by the scrap man at some stage. The cableways, still with some covers, led to the control bunker where the firing vehicle would have been parked. It was fascinating seeing all of this and realising it was intended for the West.

Although the base had long since been abandoned a security team were still in place in the shape of monster mossies. As we wandered through the undergrowth looking at more buildings it seemed the word had gone out and we found ourselves on the defensive to say the least. Steve, clearly a seasoned traveller, brought out some repellent which managed to keep some at bay though by evening we were sporting a good selection of bites!

The tour continued into the woods looking at other storage buildings – all above ground – that would have housed anything from propellants to rocket spares. Their construction varied between pre-cast concrete rib and simpler pre-cast slab types with the majority painted white inside. Soviet operational signs and instructions could still be made out on many of them as well.

With the other launch areas being the same as the first, Martin took us to see some different types of buildings



Lecava R-12/SS-4 base, murals in barracks area.
Photo by Tim Robinson

with far more substantial doors – curved or flat – and concrete posts outside. These were for the nuclear warheads with the posts supporting gantries to move them in and out. They were further away from the launch area and upon closer inspection of the surrounding woods, had defensive positions covering all routes to them. Sadly these were all locked – Martin said they were individually rented out now – so we had to make do with clambering over them and seeing if there was another way in. No luck!

After a quick relocation of the minibus we started exploring the surface buildings we'd seen upon our arrival. As is normal for such a place they were 90 percent trashed but little gems still remained such as the painted outline of radiators on the wall and a detailed poster for electricity pylons. The kitchen area was very impressive with a lot of tiling still in place, not something that could be said for a portion of the roof which had obviously decided it didn't like heights! The adjacent mess hall still had its brown colour scheme and there was evidence that the floor once sported a granite finish and small mauve, glass tiles on the walls.



Lecava R-12/SS-4 base, nuclear warhead store.
Photo by Tim Robinson

Towards the entrance to the base were two slender concrete posts topped with metal missiles and on several adjacent walls were the murals. They were very intricate, made of small stone chips on an otherwise smoothly rendered surface and all in black and white. Despite what they represented they were beautiful to look at and lovely to see intact. The last of the buildings in this area were former sleeping quarters for the soldiers' families and several were now occupied again. What you could get into had been completely stripped and didn't really give you much idea of their original use.

Having seen the majority of the launch complex we headed back down the main entrance road and north for about six miles to the next site near the village of Zalite. En route we were brought to a halt by flashing lights at a level crossing. On the left was a huge train just sitting there, diesels running but not making much effort to move.

We decamped from the bus and decided to see what was happening on the line. In the far distance to our right we could see something moving our way and then realised this was the start of a piece of single track and the passing place was on our left. With the little engine



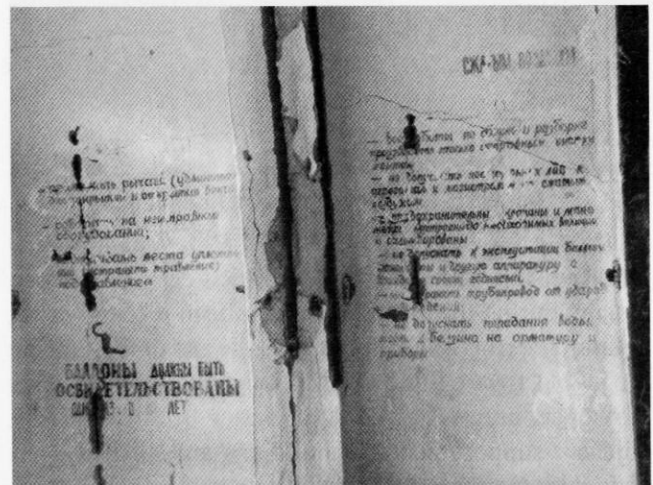
Vainode North R-14U/SS-5 base, concrete dome silo covers.
Photo by Tim Robinson

duly passed, the other lumbered into life and trundled past... and past... and past, it was long to say the least! The second site was the same layout as the first base but lacked the large selection of surface support buildings (it could be surmised that this was a back-up base which used the first one for logistics). Again we could see the launch locations with their intact metal plates and cableways and although the stores were just bare shells they still sported some nice Soviet wall instructions. As we left we noticed a small surface bunker and made a quick visit before starting the journey back to Riga.

Back at our hotel, beer and food were the order of the evening and we eventually retired very pleased with the first day's excursions. Already it was looking to be a memorable trip!

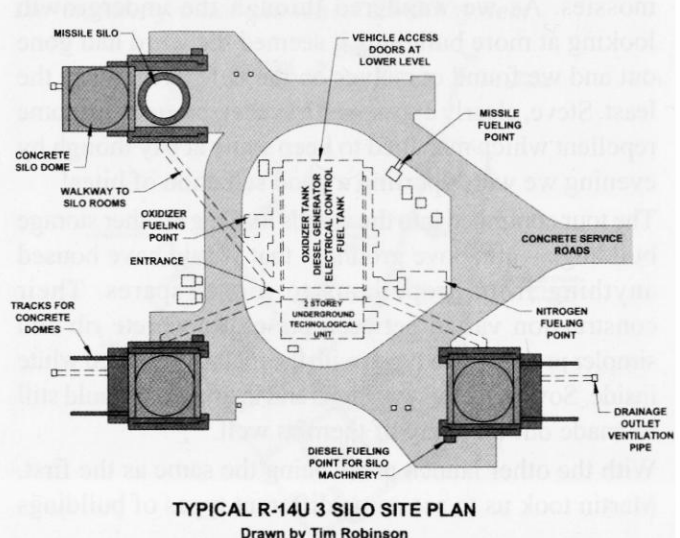
Day Two

Dawn was cloudy but dry and we were up fairly early as there was a lot of driving to do. Our first port of call was an R-14U/SS-5 silo launch base (known as Vainode North) about 120 miles to the west. Again we just drove into the site and parked up within the main silo complex! What greeted us were three huge concrete domes which were the covers over the silos and in the middle was a two-level underground bunker with access tunnels to the tops of the silos. The base was derelict which was just up our street, though Martin stressed that a lot was flooded and access to the bottom of the silos was impossible. That wouldn't deter us, we thought, so we headed for the first open access point and slithered into the fuel tank storage area. Word soon came back from the end of the room that the way through was going to be extremely wet – the depth was indeterminable – so we regrouped outside the oxidiser tank room and started again.

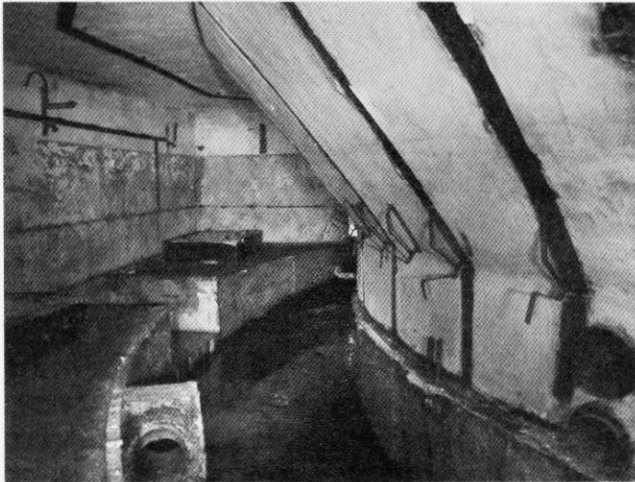


Zalite R-12/SS-4 base, Soviet service instructions.
Photo by Tim Robinson

This time it was dry and we went from room to room checking out everything we could see. Martin furnished us with details about what we were looking at and how things would have operated – he certainly knew his



subject and this greatly increased our enjoyment of the visit. Some bases had four silos whilst others, like this one, had three as shown on the typical plan on page 54. *The R-14 or SS-5 Slean (Nato codename) drew heavily on the design of the R-12 but was now 80ft long and 8ft in diameter, had almost twice the range at 2200 miles and could deliver a two megaton-class nuclear warhead. The increased range was achieved by larger-diameter fuel tanks and a more efficient propulsion system using modified, self-igniting fuels. Flight control still relied on jet vanes but accuracy had been improved by incorporating a gyro-stabilised platform resulting in fewer instrumental errors. Retro-rockets were added to prevent accidental collision of the booster with the nose cone after separation.*



Vainode North R-14U/SS-5 base, top of silo room.
Photo by Tim Robinson

Development of the surface-launched version began in 1958 with testing taking place from mid-1960 through to early 1961. Deployment started soon after and was finished by the end of the year. As final testing was taking place the silo-launched version was being developed – designated ‘U’ again – and first tested in early 1962. Soon after it was put on active service with the existing silo regiments.

Reaction times matched those of the R-12 but the silo-launched versions could remain on high alert for many days. Far fewer R-14s were deployed compared to R-12s: only 97 over a four-year period ending in 1969 when phasing-out began in favour of the SS-20 system.

In one of the technical rooms there was a small painted rectangle with Soviet text and two dates. Martin explained that the first date was when the last inspection of the site had taken place (1982) and the other was the next one due a year later. Seeing things like that really brought home that this had once been occupied and a hive of activity.

By now we had split up and were exploring at our own pace but soon found ourselves heading down the long

corridors leading to the silos. We were on the top level as access to the lower floors was from the area surrounding the actual silo and as Martin had correctly informed us, it was flooded. Nonetheless, as we stood in the circular area that surrounded the top of the silo, it was awe-inspiring.

A small hatch led up into the silo itself but with the floor below flooded, sections missing and no means of grabbing onto the tiny ladder, it was deemed a no-go. We checked out one of the other silos and then slowly made our way out into the overcast afternoon. This left us just enough time to inspect the actual domes and climbing up to the top of them really gave an idea of the scale of the place and the effort that had been put into their construction. The tops of the domes were deteriorating rapidly, the concrete powdering up with huge surface cracks everywhere and well-established trees growing out of them. In the centre of the dome was a hole about 6ft across which allowed you to look directly into the silo (it would normally have been sealed with a steel plate) and it was then you realised how much water the lower levels must be under. It was about two-thirds full and considering the R-14s were almost 80 feet high that was a lot of water!

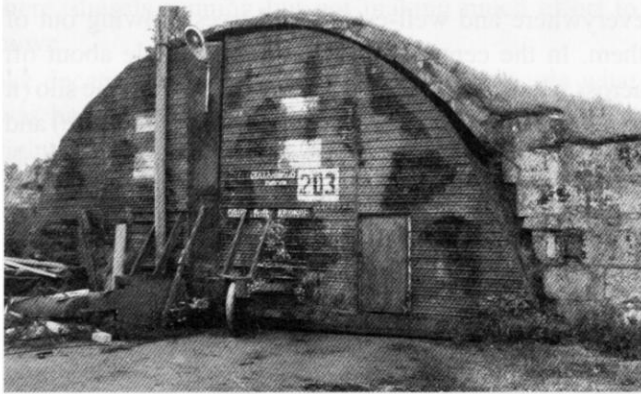
From the top you could see the whole layout including the other two domes, the vents and exhaust pipes from the central bunker and the ‘bed’ where the dome would slide back for loading or launching. Around the sides under huge slabs of steel were the pulleys and mechanisms for moving the dome back. It must have been quite a sight to see this huge mass slowly move back to reveal its sinister contents.

On the way out of the site we stopped off at another couple of storage sheds, different again to the previous R-12 base ones. These were much bigger, made of huge reinforced concrete slabs and featured sliding concrete external doors with a locking mechanism at the head. Much discussion followed with the general consensus being that it had to be for either mobile launchers or warhead supply vehicles. Another of the garages had some smaller rooms off to the side where we all marvelled at a fume cupboard with exhaust ducting still in place and a rather bright colour scheme! There were also examples of the warhead stores with gantries outside similar to the R-12/SS-4 base.

Next we headed off to another R-14U/SS-5 silo site, about twelve miles south near the village of Vainode. Martin confirmed this was flooded as well so we spent the time looking in more detail at the domes, their operation and the service access into the rooms surrounding the silos. The layout was just as the earlier one and you could easily mistake it for the other without looking closely. Leaving the site we stopped off at a communications bunker for a quick snoop about and found a battered but intact telephone plug-board frame and a scorched world map with Russian text.

The afternoon was getting on so Martin suggested two last visits that were effectively drive-bys but were well worth it as we were in the area. First was the abandoned station at Vainode which had been restored on the front but left just as the day it was closed on the rear. We soon discovered that the front rooms were used as a small town museum (closed) hence the nice paint job!

The line and station were scheduled for closure in August 1997 but protests by local people and businesses managed to keep it open until early 1998. Passenger numbers had declined during the 1990s and a comprehensive review of the transport system for the area showed more people were buying cars and buses were more convenient. The closure of several local businesses and withdrawal of Soviet forces from the local air base added to this decline and the inevitable was just a couple of years away.



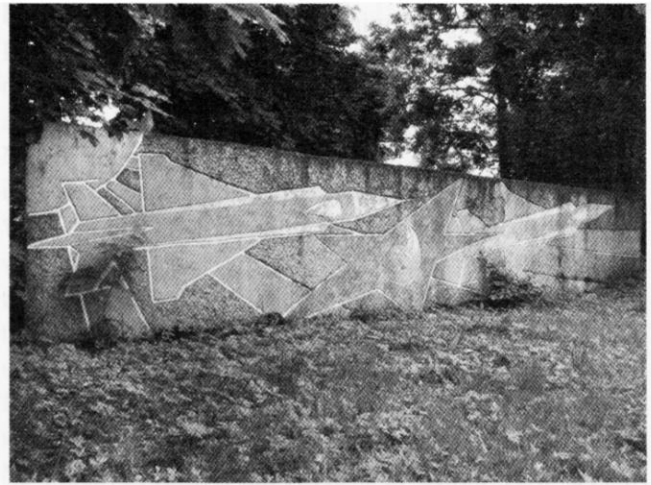
Vainode Soviet air base, period hanger.

Photo by Tim Robinson

Photos completed, we made the short trip over to the air base at Vainode which although abandoned still had some nice little bits dotted about. As we entered the overall site we passed some very nice painted signs which we'd look at on the way out. The usual HAS were dotted about so we took a tour of the taxiways with Dan eventually gunning it down the main runway with side door open for maximum effect. I don't think we reached the rotating speed of a MiG-21 but it seemed quite fast!

Martin directed us over to one of the taxiways on the far side where he wanted to show us a period hanger complete with camouflage and wheeled door. It was in remarkable condition and clearly being used by someone for storage/living. As we sat in the minibus discussing this we noticed an MPV heading towards us at a reasonable speed. Pulling up beside us, the driver was clearly not pleased we were there so after a Latvian/English exchange resulting in 'Mutually Assured Confusion' we made a hasty exit. Luckily he thought we were not worth chasing off the base as he only followed us for a few hundred yards!

Next stop were the signs at the entrance which were still colourful and clearly depicted what went on here. A couple of others had suffered at the hands of vandals as they were laying face down or in a crumpled pile. In the distance five-storey accommodation blocks had slowly



Vainode Soviet air base, entrance murals.

Photo by Tim Robinson

succumbed to the flora and fauna and those fascinated with fire, a typical situation on these sites where they are so vast that security is simply not possible.

A 40-mile drive west lay ahead of us to our hotel in Liepaja so we decided that was it for the day; with Dan doing all the driving he was now looking forward to chilling out. Luckily it was a straightforward route and we duly arrived at the hotel with no dramas. We eventually found ourselves in the bar and after a quick discussion decided hotel food was the easiest option for the night.

Day Three

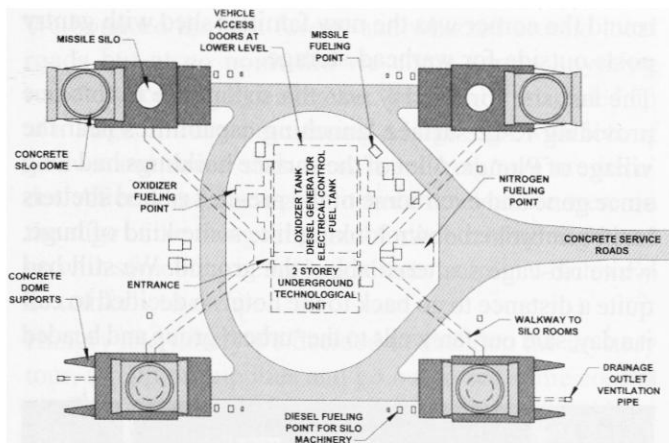
Another early start was required as we – well, Dan – had lots more driving to do. We were crossing the border into Lithuania heading 90 miles south to an R-12U base that had been turned into a museum. This was the only silo base set-up as a museum and Martin had already been telling us how much we'd enjoy it as there was a fair amount of kit still in place. The drive there gave us time to see some of the countryside and we noted that many people working the land were using very basic, animal-driven machinery.

As we approached the border we prepared for the usual passport showing but it was clear no one was at home so we trundled through and into Lithuania. Our initial destination was the village of Plateliai where we were due to meet our guide for the day. Arriving a little early, we wandered off to investigate things and see if lunch could be purchased at the local store. An interesting sign greeted us at the front door – a gun with a red line through it. Checking our pockets (!) we entered and after some browsing managed to find something that would fill the nutritional gap.

Our guide soon showed up and after introductions we followed her to the museum where we met up with an 'urbex' group from Riga who had driven over to meet and spend the rest of the day with us.

Here's a little bit of information about the site:

As the Cold War gathered pace the Soviets were well aware that the U.S. had underground missile bases



TYPICAL R-12U 4 SILO SITE PLAN

Drawn by Tim Robinson

and decided it was the next route to take in order to maintain a military advantage. In September 1960 the village of Ploksciai (about 3.5 miles southeast of Plateliai) was chosen for such a base as the soil was easily excavated; the local population small and could be moved for a relatively small amount of money; it was well over 500ft above sea level, and all of Europe could be targeted by missiles from there.

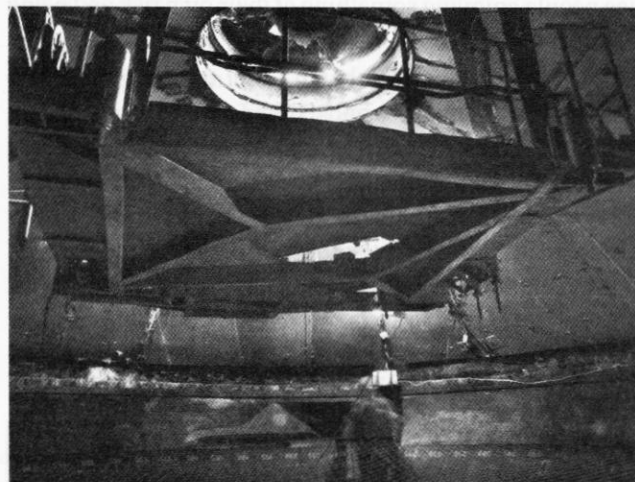
By the end of 1962 the base was complete and featured four silos, a central operations/technical bunker and a 1.5 mile-long tunnel from nearby Plateliai lake supplying fresh water to the base. Four R-12U nuclear-tipped missiles were installed, fuelled and aimed at various locations in Western Europe. The missiles were expected to last between 10 and 15 years in the silos and were changed only once in 16 years whilst the targets were changed every 3 to 4 years on a rotational basis with all sites across the USSR.

Additional warheads were stored at the ammunition depot in Plokstine and extra missiles stored at the surface missile base at Sateikiiai. Under normal conditions the personnel could survive in the complex for 15 days but in a state of high alert and hermetically sealed, this dropped to only three hours. The base was protected by the usual combination of barbed wire and electric fences, intruder alarms and dog runs as well as armed security patrols.

Next to the base was a canteen and two wooden barracks where nine relief officers and 22 soldiers stayed, waiting for the shift change which took place every three days. Inside the complex, personnel worked for 6 hours in the silo area and then had 6 hours off. There is no indication as to whether they then moved to a technical area for six hours or simply went back to the silos. In the nearby town around 320 personnel lived including three groups of officers and soldiers, technicians and support staff.

There were the usual headquarters, barracks, officers' quarters, canteens, medical posts, stores and

a huge parking area. This allowed space for the two 80ft-long vehicles for loading rockets into the silos and the various support vehicles. The missiles were finally removed from their silos in June 1978, with the whole site being abandoned by the end of that year.



Plokstine R-12U/SS-4 base, inside the silo.

Photo by Tim Robinson

As this was an R-12U base – code named Dvina – it had four silos instead of three and, being a museum, the trees and grass had been kept under control so you could clearly see the four domes and the various vents from the central bunker. A typical plan is shown here:

We were pretty much allowed to wander the site at will which meant we could go at our own pace and enjoy everything we saw, a great plus. Martin was certainly right about the kit as there was plenty still in place and some of the rooms had been mocked up to show where people slept, etc. and of course having seen the previous ones derelict, this really helped us understand the base.

As is traditional with all trips I drop further and further back until I'm either completely on my own or am meeting the others as they are getting ready to leave! I was merrily taking photos and slowly working my way up to one of the silos and, true to form, I started to meet the others clambering out of the silo hatch. The looks on their faces said it all and I duly waited my turn to get into the actual silo.

Once through the hatch there was a single person-width walkway that ran round the whole silo opening with another hatch opposite. The top couple of feet of the silo casing flared out and was marked all the way round in 5-degree steps with a huge platform overhead – yes someone did get up there! – and daylight coming through the hole in the top of the dome. One has to assume that the platform was for maintenance works on the warhead once the missile was in situ as there appeared to be no other way to do that from the walkway.

Lost in the thought that I was actually standing in a missile silo, I'd completely missed the fact that the surrounding walkway was slowly filling with people and they were

shuffling round towards me making escape almost impossible. Dispensing with further photos I studied my fellow companions and realised they were a large group of regular tourists on an organised visit yet dressed for a stroll along the beach! In these days of 'nanny states' and Health and Safety gone bananas it was refreshing to see people enjoying something at their own risk and being captivated by it.

Descending through the hatch I met the stragglers who had not ventured above and exchanged the international signs of amazement and awe (raised eyebrows and rolling eyes, blown-out cheeks and huge smiles). I headed back down the access tunnel and could hear the rest of my group milling about in the lobby. I recalled the events in the silo and about being trapped but sympathy was short on the ground... "that's what happens when you're always last." "Fair enough," I said, with a Cheshire-cat-sized grin!



Plokstine R-12U/SS-4 base, corridor to silo.
Photo by Tim Robinson

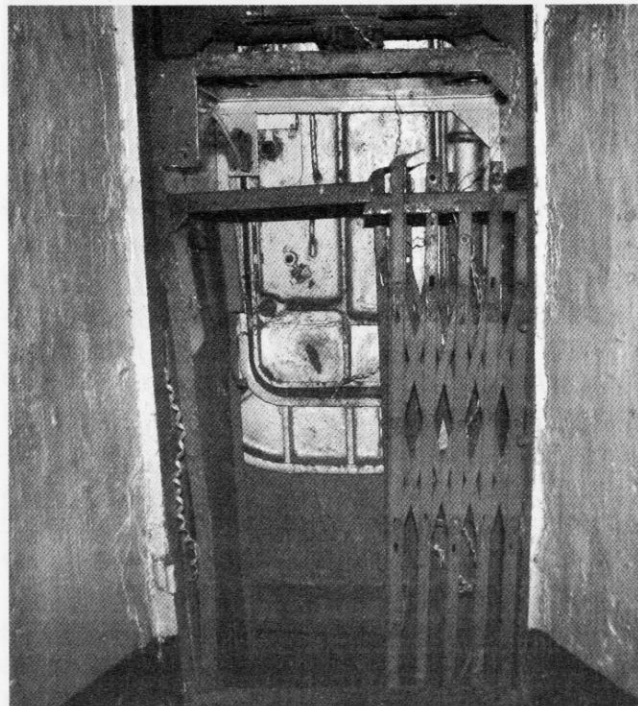
Our guide had realised we were serious about exploring the site and pointed to the tunnel with barbed wire across it, nodding when we asked if we could go up there. With no lighting or attempts at replacing collapsed floors, this was back to what we thrived on and we spent a good 45 minutes in this silo. The access tunnel enters the silos at the top with an elevator to take personnel down to the lower levels.

Martin pointed to a very narrow metal ladder and said the elevator car was on the floor below and worth seeing. Space was at a premium at the bottom of the ladder but there was the elevator, rusty and sort of in place but not something to try out! It was amazing to think this was the only way down to the service areas below as if there was a staircase we didn't find it.

We finished final photos and then slowly made our way out and into daylight. There was just time for some site photos and a group shot with the 'urbex' group before our guide took us for a quick tour of the military town. All buildings were locked but we could see inside some of them and get a feel for the size of the place. Just

round the corner was the now familiar shed with gantry posts outside for warhead storage.

The last site for the day was the sister base to this one providing R-12 surface launching capabilities near the village of Plunge. A lot of the surface buildings had long since gone and even some of the pre-cast ribbed shelters had been broken down looking like some kind of huge, white rib-cage scattered about the ground. We still had quite a distance to go back to the hotel so decided to call it a day, said our farewells to the 'urbex' group and headed off.



Plokstine R-12U/SS-4 base, lift car.
Photo by Tim Robinson

By the time we had got back to the hotel, the weather had perked up considerably so Richard, Bob, Steve, Gavin and myself decided we'd have a walk down by the river, take in the sights including the local naval ships and see if there was an alfresco eating venue available. The naval ships turned out to be minesweepers and we even found a small underground building conveniently labelled 'bunker' (closed) before settling on a steakhouse overlooking the harbour. We spent the rest of the evening in the setting sun and only headed back when the sunset was finally disappearing. A perfect end to another superb day!

Day Four

An even earlier start greeted us today as we had to get Martin back to Riga airport for his midday flight home. At a brief stop midway for refreshments, Martin gave us some ideas of what to do after dropping him off. There were some bunkers in the Riga forests which he'd previously found and weren't too far from the airport. We jotted down the lats and longs and after bidding him farewell and a good flight home, headed off in the directions given.

We bounced through forests and whizzed around local roads but at no point did we come across anything remotely looking like a bunker. Eventually we ended up at a large military base facing a huge sign with lots of arrows and zones shown on it and red 'you are here' dot. After some discussion it became clear we were on the edge of the firing range and further driving might end up with something being locked onto us from which we'd be unlikely to escape!

Hungry and thirsty we decided to abandon the mystery tour, top up on supplies and go out to see some coastal batteries Dan and Bob knew about. However, we'd not counted on the day being a public holiday and the world, their wives and assorted children were at the beach making the prospect of parking and exploring somewhat difficult. Munching the usual 'exploring' lunch of crisps, cheese, biscuits and chocolate, Dan announced he had one more site which looked interesting on Google Earth and what did we think?

We had in mind a visit to the air museum we'd spied on our arrival but this was several hours away and it seemed a waste not to go and see what we could find. We were not to be disappointed yet none of us really knew what it was for or why it was built where it was. It was a huge surface building made of reinforced concrete consisting of a curved central section – much like a HAS – and a rectangular entrance/service block at each end.

Huge amounts of sand had been excavated, possibly for use elsewhere, but in the meantime these were piled up around the edge where the clearing met the forest. It was definitely abandoned in mid-construction as both inside and out featured unfinished passageways, rooms and service tunnels. Door frames had been cast into the walls but few doors were in place and only basic ducting runs had been allowed for at high level. Raised floors were missing and although there were blocks with cast-in bolts for what were probably generators, there was no sign they had ever been installed. All in all a strange place with an unknown history.



Riga, unknown bunker. Photo by Tim Robinson

It was now time to get back to the airport, drop off the minibus and hopefully see round the air museum. With the latter completed we found the entrance gate and rang the bell. A young lad opened it and in pidgin English confirmed they were open for business and it was 5 Lats (£4.50) per person, not too bad considering what we were about to see.

It was a mixed collection of aircraft, trucks and spares but all being from the Soviet era, hence not too much you'd see at home. The 'Backfire' bomber was outside the fences so we could not get as close as we hoped but once the owner realised we wanted to see a bit more he led us through the spares and undergrowth to get as close as possible. It was an impressive sight and certainly for me, the first I had ever seen in the flesh, so to speak.

With the owner in tow we now got a behind-the-rope tour and general poke about amongst the spares. It was one of those places where anything aviation-related was being stored, from compressor blades through to jet engines, cockpit windows sporting battle damage, huge undercarriage legs, complete aircraft and whole cockpit sections.

The owner motioned for us to follow him to one of these cockpits and climbing up the steps he told us this was Khrushchev's personal plane and he had only just managed to save it from the scrapyard. It was very impressive inside, no glass cockpits here, all switches, dials and good old-fashioned control columns.

The place was due to close at 1800hrs so we were slowly making our way towards the entrance when the owner asked if we'd like to see inside the MI-6 helicopter – silly question really! In groups of two – the inside was chock-full of more bits and pieces – we were led up to and shown round the reasonably spacious cockpit which had fewer dials and switches than I expected for such a huge helicopter.

Expressing our thanks for the extra tours we left the museum and made our way back to the airport for a well-earned rest and some food at TGI Fridays. Sitting round the tables, we chatted about all sorts of things from the past four days and quickly decided it had been an absolutely superb trip.

So had it been the 'holy grail' trip I thought it might be? Well on paper, it certainly ticked all the boxes but in reality all it did was open my eyes to a whole new set of sites I want to visit! I've now decided there can't really be such a trip as there could always be something else to see that might be better...

Thanks go to Martin for all his insights into what we were seeing, and of course to the rest of the gang for their laughs and entertainment throughout.

And finally I'm dedicating this to Dan as we would never have seen any of this without his hard work – he will be sorely missed from future trips.

Nottingham City CD Control Bunker

by Keith Ward

In September 2009 a visit was made to the former Nottingham area Civil Defence Control, which it was thought had been demolished, but was in fact intact having had a house built on top incorporating the bunker as a rather superb and large basement!

This is the story of this fascinating site. . .

The City and County of Nottingham (CCN) was very proactive in civil defence. During WW2 the main control was in the caves beneath the central fire and police station; the site contained the controls for the police and fire also run by the CCN. The city made extensive use of its famous cave network as shelters and eight sub-controls were established around the city in City Hall and also in school buildings.

Postwar Civil Defence policy

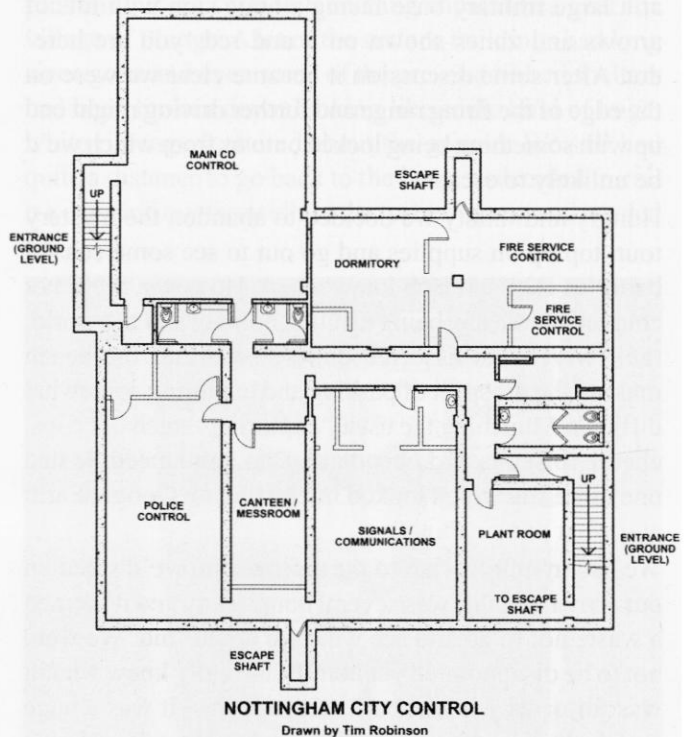
After World War II, when civil defence was re-established in 1951, Nottingham was designated a Grade 'A' target because of its then industrial and transport importance. This qualified it for a Home Office grant of 75-100 percent for construction of a protected control centre.



The training centre prior to demolition c.1991.
The control centre is beneath this building.

The site selected was to the north of the city in Edwards Lane, a quiet suburban road near to the City hospital. Construction was completed in 1953, and as well as the control bunker there was a surface training centre building built above it, and adjoining it a training village with ruined houses to assist rescue training.

Along with other County boroughs such as Leeds, Derby and Sheffield that ran their own fire and police services, this bunker incorporated wartime police and fire control rooms as well as the main CD control room. It is believed there was also a small BBC Studio for local emergency broadcasting; evidence for this comes from a local BBC engineer at the time and local historian Roger Grines has received a letter from BBC Archives stating there was a local TX/RX site at Bar Lane only about a mile from Edwards Lane. This would be fairly unique for a local



authority control in the 1950s, although in the 1980s a number of local authority controls had studios, eg Cornwall County Council.

The publication of *The Strath Report: Britain confronts the H-Bomb, 1954-1955* caused all CD bunker programmes to be discontinued unless under construction, as they were deemed useless against the H-bomb; the Leeds and Derby schemes were thus cancelled. Nottingham's CCN control is therefore a unique survival of a site with combined fire/police/CD controls; the only other purpose-built one was Sheffield's which has long since been demolished.

However, Nottingham also prepared a plan for four sub-controls built to a smaller size than the main bunker, and one of these was built before *The Strath Report* axed construction.

This was in Ransom Road but was apparently never used; a surviving sector map from 1968 does not even show it as a sector post. The exact site has not been established and a thorough search found nothing on the ground, nor did a 1971 aerial photo reconnaissance of the area. However the 1955 CD Committee minutes detail its completion in March 1955.

From 1957 to 1965 County borough controls and County controls were merged into County Area schemes. For example, Nottingham's CCN control was an Area Control within the Nottinghamshire County Scheme. The main county control was at Shire Hall but moved to the semi-basement of the new County Hall at Trent Bridge in about 1959.

Each Area control had subordinate Sub-Area controls and the CCN control had its control area expanded to include certain parts of Nottinghamshire. Sub-Area controls were:

- Gedling UDC offices
- Beeston town hall
- Long Eaton CD training centre
- Hucknall council offices
- West Bridgeford UDC offices

Apart from CCN and County Hall, there were no postwar purpose-built controls in the county although Southwell RDC, West Bridgeford UDC and Newark UDC used WW2 reinforced blockhouses adjoining the council offices (all now demolished).

In 1965 it was all change again as we went back to previous system with County Boroughs having their own CD controls independent of the County controls.

The end of Civil Defence

In 1968 Civil Defence was axed and only County controls and one designated standby site were put on 'care and maintenance'; this in reality meant left to rot or used as a storeroom despite a proviso that communications should be maintained.

In 1974 CCN was reduced in status to a District Council within Nottinghamshire. The Edwards Lane control was listed in 1974 as the control for the new District Council and again in the 1976 War Plan for Nottinghamshire. Like most plans at that time this was a paper exercise with no maintenance of facilities or staff trained to work them! There were also nine sub-controls listed but no locations designated and no one trained to run them.

New government brings change in policy

The fire brigade and police had had no interest in the wartime controls since the early 60s; their policy in the 1970s was sandbagging their premises. Then in 1980 the new Thatcher Government took a renewed interest in civil defence, encouraged councils to train staff to operate controls and made grants available for building new control centres and improving existing ones.

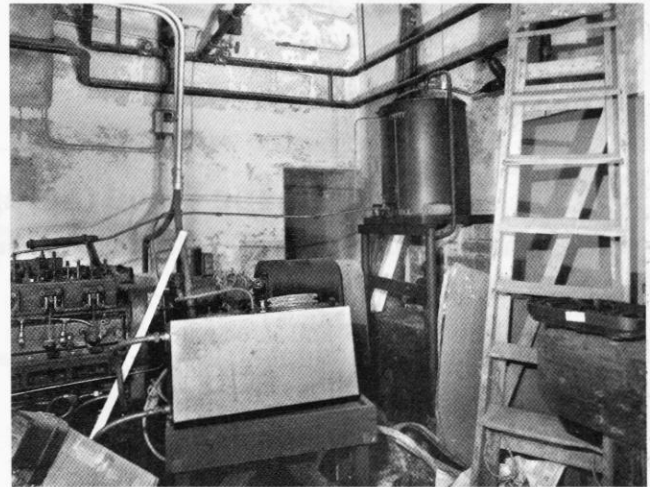
The policy was to have a control centre at or very near council offices, so Edwards Lane was left unused, but at a later date the county was keen to see a proper control for the city using a 75 percent grant available from the Home Office.

The basement cellars of City Hall were designated as Control but the City Council was very left-wing and declared civil defence a waste of time, so did just its statutory minimum. We assume the Edwards Lane site was just left empty, however it seems some checking of generators was undertaken in the 80s by the County Council, and it's possible the surface building was used by another city council department. Many CD training centres were handed to education departments after 1968, being ideal for that purpose.

At this time Nottinghamshire County Council was investing in its CD infrastructure, but political fighting with the City Council prevented the County's desire to see Edwards Lane modernised and reused to replace the inadequate City Hall site. As the City Council owned Edwards Lane the County could not force its hand.

A purpose-built bunker was built at West Bridgeford for Rushcliffe DC, putting Nottingham DC to shame, also at Gedling DC offices. A modernised Edwards Lane would have made a first-class control. Then in 1991 Civil Defence was axed again and the dormant Edwards Lane site sold by auction.

The bunker survives



The plant room. The standby generator can be seen and behind it one of three emergency exit shafts.

Photo by Nick Catford

In about 1991, the old training centre was demolished and a very nice house designed by an architect was built on the site; it has now had two owners. The bunker forms the basement below ground and is little altered. The owner at the time of our visit had just sold the property and we await with interest to see what the new owners will do with the basement.

The bunker is in extremely good condition and a number of wall maps showing Sector and Warden Posts from 1968 were kindly donated by the owner – these have been removed and will eventually be relocated to the museum at Kelvedon Hatch.

There are three control rooms; the smaller police and fire control rooms still have the enclosed glass booths for the Chief Controller. The larger main CD control room was halved in size when a swimming pool was built in the garden above and used part of bunker space. Regrettably the main controller's glass booth was removed at that time and the swimming pool has now been filled in.

The main control room is damp with some water on the floor but generally the rest of bunker is dry apart from some damp around one of two emergency exits – these consist of a short tunnel and ladder access to the surface and are now blocked.

The signals room retains a table and all the electrical/phone points; there is also a small canteen with a serving counter. Most of the lighting still works but the real gem apart from the controller's booths is the generator room. Still smelling of oil, it's completely as it was left in 1968 with the generator still in place.

The current owners have just used the bunker for storage but it's uncluttered, and the main CD 'ops room' is used as a games room.

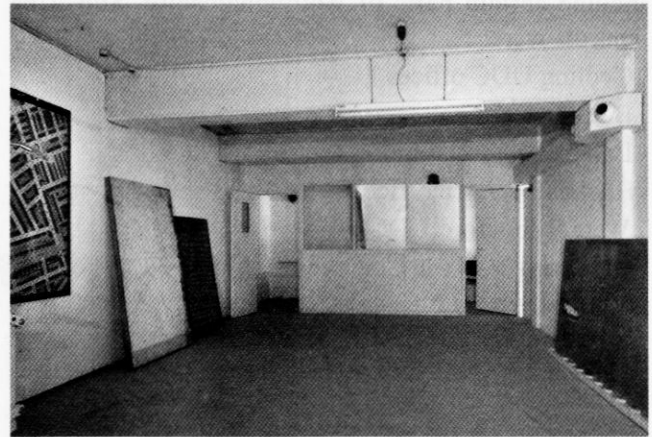
It was fascinating to visit such a historic bunker oozing with atmosphere due to its unique incorporation into a house, and I am indebted to SB member Jayne Amat for organising the visit and doing the initial research.

Sources

Nottingham city archives

Nottinghamshire County Record Office — County ARP and CD minutes

Emergency planning officers at Notts. County Council, Rushcliffe DC, Broxtowe DC and Nottingham DC.



Police Control room
Photo by Nick Catford

The Snape Wood (Scrag Oak) Mine – TQ 634302

Researched and written by Gwen Skae for the Industry & Agriculture Group, Wadhurst History Society

The South Eastern Railway opened a branch line to Tunbridge Wells in 1845 and later extended the line through Wadhurst to Robertsbridge and Hastings in 1851-1852. During construction work a prominent seam of iron ore was revealed on both sides of the line. Evidence of the iron ore deposits can still be seen to the north side of the railway in the form of a massive seam of silty siderite rock. Despite the fact that iron mining had long since been uneconomic in the Weald, someone was evidently persuaded that it would be a viable proposition to attempt to produce iron ore at this site.

It has not been possible to establish the original ownership of the land in question beyond doubt. The Book of Reference associated with the South Eastern Railway's acquisition of land in 1845 shows the owner of land to the north of the stream known as 'Wenna's burn' as being Alfred Playsted. To the east of his land, a field between the woodland boundary and the road was owned by John Tompsett. To the south of the stream the land was owned by John Newington and to the northeast of this William Swift owned land near the junction of Snape Lane and Wenbans Lane. The 1841 census has a John Newington – farmer aged 50 living in Towngate – and a William Swift – farmer aged 45 in Pennybridge – but in the 1851 census neither John Newington or William Swift are mentioned.

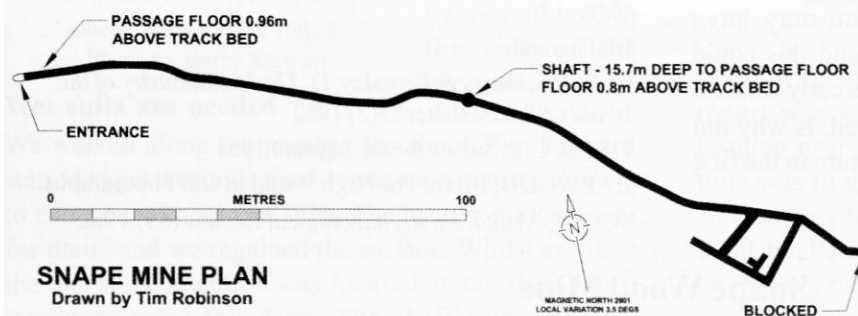
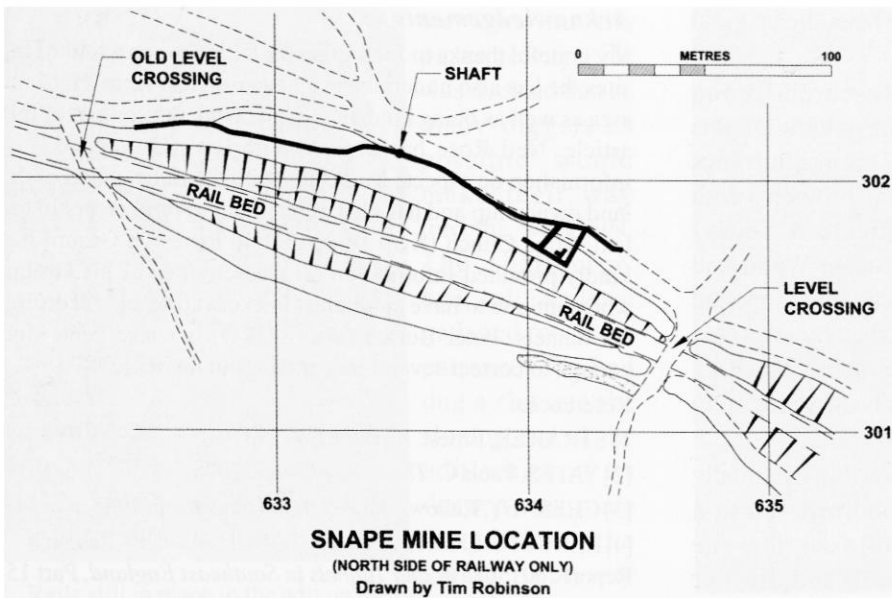
To further confuse the issue there were two Alfred Playsteds living in Wadhurst Town in 1851, possibly father and son. The elder Alfred, aged 68, was a butcher in the centre of town whilst his (presumed) son, aged 42, is listed as a beer retailer of the Snape Wood Beer Shop. Perhaps Alfred Playsted senior owned Snape Wood as an investment. Perhaps father and son saw the business potential of the newly-revealed seams of ore. If so, it

would be interesting to discover who was persuaded to put up the money to develop the mine. Did they persuade someone with mining/construction knowledge who was working on the new railway track to take a gamble on this somewhat risky venture, or were they financially involved in the project themselves?

It has been suggested that the South Eastern Railway Company may have had some financial involvement in the venture. There are still a lot of unanswered questions. From whatever source, money was found to sink mine shafts on both sides of the railway (on land now owned by the Forestry Commission in Snape Wood, and on private land to the south of the railway line) and to excavate tunnels consisting of galleries and cross cuts. On the south side of the railway[1] only one bed was worked, whilst on the north side, where the seams were more reliable and productive, two were mined. The beds



Looking along adit on the south side of the railway towards deeper water. Photo by Nick Catford



North mine surveyed & originally drawn by Rod Le Gear.

to the north side were also more easily accessible. Here the main gallery is about 450 feet long, by 4 ft 6 ins wide and varies in height from six to eight feet. Parallel galleries were connected to the main one by shorter tunnels at right angles to them.

However the seams of ore were very irregular, dying out suddenly and reappearing at intervals, making extraction frustrating. Added to this, the ore was of poor quality, low in iron oxide and high in silica content, making the extraction of the metal technically difficult. Facilities for this process were not available locally and the mined ore had to be sent to Staffordshire for smelting.

It has been suggested that a special railway siding was constructed so that the ore could be loaded and transported easily to its destination, but no evidence has been found to substantiate this claim. There is no doubt that the variability of the seams, and the high cost of transportation would have added considerably to the cost of production.

In addition to these handicaps, according to Paula Yates[2], new Acts of Parliament and competition from more efficient producers elsewhere were among the factors which made the mine unprofitable. In little over a year, having started mining in August 1857, the enterprise closed down in September 1858. The whole operation must have represented a considerable investment of manpower, expertise and capital, and leads

one to wonder who made a profit (if any) and who a loss on this speculative venture.

During the construction of the new railway line a beer house was trading in Snape Lane, near the railway bridge between Snape and Scrag Oak, which became known as *The Locomotive*. It supplied beer to the railway construction workers, known as navvies; Chesney[3] suggests that they were a rough lot. An engineer told an official enquiry in 1846 that it was dangerous to approach them when they were not actually at work. In small parishes where law enforcement was undependable, navvies could create mayhem, fighting, accosting local women, and helping themselves to local game and produce.

Chesney states that "beer was customarily carted to construction sites and sold in gallons to the sweating men". Supplying these construction workers must have yielded a healthy profit for the landlord of the *The Locomotive*, but once the Wadhurst section of railway

line was completed (in 1851) and the navvies moved on to construct the next section of the line, the beer house must have suffered a dramatic drop in takings. Perhaps the landlord managed to persuade someone involved in the construction work that mining the newly-revealed seams of ore would be a good investment, not to mention the possible benefits to the beer house.

Whether or not the landlord had any input into the new enterprise, *The Locomotive* soon changed its name to *The Miners Arms* and it now became the supplier of beer to the miners at Snape. However since the mine closed down in barely over a year the landlord would once again have suffered a drop in takings. Nevertheless, despite these setbacks the beer house survived until 1955. In 1908 the Earl of Sheffield commissioned a Professor Gregory to report on the commercial viability of reopening the mine and he recommended against it[4]. According to Joseph Braddock[5] a local inhabitant told him that an attempt had been made to work the mine during the World War I in response to the demand for iron for munitions, but was given up owing to the difficulty of making a suitable siding on the railway. This reinforces the evidence that such a siding may never have existed. The mine was surveyed in 1936 and then sealed off. More recently, in 1982, a site was examined by Tony Jarratt (BEC, Sub Brit.) and friends, most likely the one on the south side of the railway. They found two open-ended depressions

at either end of a rake which may have been the original adits.

In 2000 the Kent Underground Research Group excavated the site and photographed the galleries, some of which may have been dug in 1857. In recent times parts of the tunnel roof have fallen in and problems with flooding have made excavation difficult. A newly-constructed access to the tunnels in Snape Wood had become waterlogged, and the large plastic tubes inserted to form an access route had been squashed by saturated clay around them. Clay slurry and other debris blocking the tunnel was removed by diverting a nearby stream to wash through the obstructions.

This proved to be a complicated operation, but eventually the plastic access tube was cleared and restored to a usable condition. However there was still a considerable quantity of water within the tunnels and further investigation of the shafts had to be postponed. It seems likely that the 1857 mining operation may have experienced similar drainage problems and this could have been one of the reasons for the mine's early closure. A tantalising question, still to be answered, is why did someone think this would be a viable venture in the first place?

Snape Wood Mine

An account of the excavation by Kent Underground Research Group

Mike Clinch

In 1999 Peter Burton arranged two visits to the site: the first to decide on possible digging spots and the second to shift some earth. On the second visit about eight of us made for the two most hopeful sites, one being a filled shaft and the other a possible collapsed shallow tunnel. Iron was mined from the Ashdown Beds at Snape Wood from August 1857 until abandonment of the mine in September 1858. According to one source which I have been unable to verify, ore came from three different horizons, two of which outcrop along the railway cutting and may have been worked in the past. These two bands of iron-rich sandstone are 18 inches and two feet six inches deep respectively.

The Earl of Sheffield commissioned a Professor Gregory in 1908 to report on the feasibility of restarting mining in the area. Professor Gregory's report stated that there was no prospect of mining in the area ever becoming economically viable.

Excavation begins

The shaft diggers got down about ten feet, the going being mixed. The other group finished about ten feet from the surface at the deepest point and a rough survey indicated that we would have to go down another five feet at least. The first shaft is on private land (we had the kind permission and goodwill of the owner). The northern shaft was on land owned by Forest Enterprises and we acquired

Acknowledgements

My grateful thanks to John Bush for taking me on a tour of the sites; he has also undertaken some geological research of the area as well as being kind enough to check the content of this article. Neil Rose has been a mine (no pun intended) of information on aspects connected with the railway and of the land ownership and has also pointed out several errors in the text. Mike Clinch (Kent Underground Research Group) has kindly provided information on the activities of his Group, who continue to have an interest in excavating and recording the tunnels. Peter Burton (also KURG) has also been kind enough to correct several inaccuracies in my text.

References:

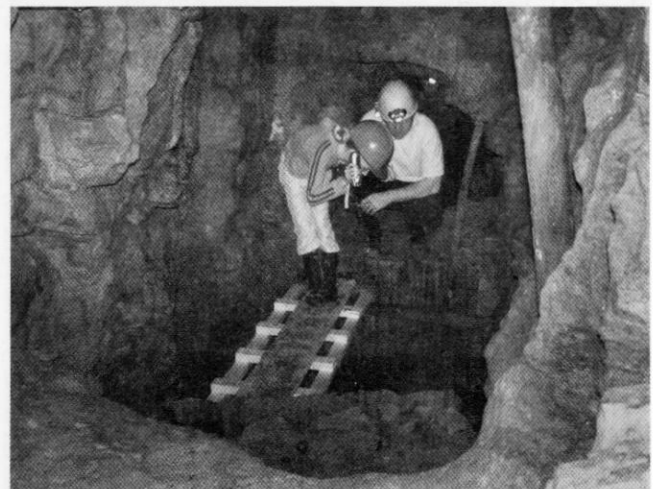
- 1] STRAKER, Ernest. *Wealden Iron* 1931
- [2] YATES, Paula C. *The Story of Snape* 2005
- [3] CHESNEY, Kellow, *The Victorian Underworld* 1982
- [4] KENT UNDERGROUND RESEARCH GROUP—Research Report 2001: *Caves and Tunnels in Southeast England*, Part 15
- [5] BRADDOCK, Joseph, *Footpaths of the Kent-Sussex Border* 1947

Bibliography:

- CLEERE, Henry & Crossley, D. *The Iron Industry of the Weald* CSS Newsletter 25(2) 1982
FIELD, C. S. *Sussex for the Layman* 1951
HARWOOD, Brian, *The High Weald in Old Photographs*
SCOTT, Alan. *Kent Archaeological Review* (69) 1982

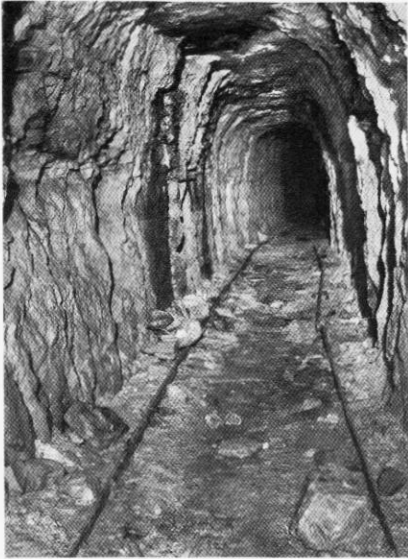
a permit from them to carry out our excavations. It was our intention to excavate the shaft and adit on the south side of the railway before tackling the shaft to the north of the railway. Work proceeded throughout the year on a regular basis, both at the shaft and where we suspected the adit entrance to be.

The last trip to the mine in the old millennium proved to be a very productive. After about two minutes digging



Looking into the intersection of the shaft and passage in the mine on the north of the railway. It shows the bridge over the attempt to deepen the shaft which is now full of water.

Photo by Dave Cushing



Rails still in place in the adit on the north side of the railway line, sleepers long since rotted.
Photo by Barry Stewart

we were into the passageway. It was decided that as many diggers as possible would make their way into the workings. The shaft crew was told and we gathered round the entrance. We had dug a slot into the sloping end of the adit which at its deepest was some 5m below the surface. The way into the mine was by a small hole in the side of the excavation.

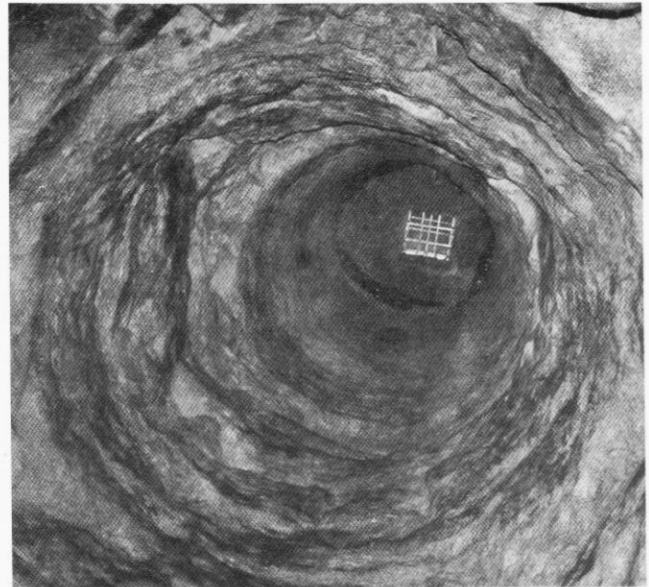
Wet suits are needed

We walked along the passage for about 30m before it started to get wet underfoot. It was soon getting too deep to carry on without wet suits. The local contingent sent for theirs and we regained the surface. Whilst awaiting the wet suits, attention was focused on the shaft which was now some 9m deep. The shaft sides are well compacted and there is some evidence of brickwork on the railway cutting side.

The wetsuits arrived and Peter Burton and two others made their way along the passage. The water was soon chest high. When they got to the vicinity of the shaft we could hear their voices. Clive Fitzjohn, who was working in the shaft, made a hole in the side and was able to touch spades with the 'wet' group. The tunnel group pushed on to the end, which we reckoned was within 3m of where we had forecast the other end of the adit would be. We had started a dig there but decided to backfill this to reduce the number of access points.



South side of the railway line. The shaft is just to the right accessible through a small hole. Remains of original timber roof supports can be seen.
Photo by Nick Catford



Looking up north shaft through bat grill.
Photo by Dave Cushing

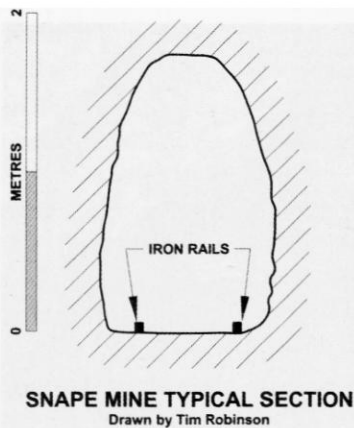
None of the transverse passages mentioned in the old report was spotted, except for a possible start to a heading near the shaft.. However the main aim at the time was to get to the end and get out and dry off as soon as possible. The next visit was planned for January 2000, but Peter had looked into the passage in December after heavy rain and had found that it was flooded almost up to roof level and that there was nearly 2m of water in the shaft.

The next visit was at the end of January when we were going to start on the northern shaft. However, as this was by a public footpath, we had to secure it before we started to dig. We arrived with ballast, cement mixer, generator, reinforcing rods and tools with which we made up a form to pour concrete in for the entrance and a previously-made steel lid that could be secured.

The area was opened up to expose the edges of the shaft and the site prepared with the reinforcing rods and shuttering for the entrance. Throughout the day cement was mixed and poured. This operation was the source of great interest to the various walkers and dogs who passed by. By the end of the afternoon the cement was in place and the lid was fitted. Some time later vandals cut off all the locks and the entrance was modified to provide access only for bats. To date, as far as we know, none has taken up residence. Following a rather fraught exit from the mine of one of the Sussex Bat Group, perhaps this is just as well.

Water is a problem

Several of us ventured into the passage and were able to walk along for about 30 metres before reaching the water. In the passage the noise of water flowing away was very loud; on entering it sounded like a burst main. About 15 metres in, the water is running into a crack in the side of the passage – the noise indicates there is a fairly large cavity. It may be the source of a spring lower down the



hill. The owner of the house on the edge of the wood told us that this was the water supply for the house prior to mains water being laid on and he has a right of access to the spring. We are quite certain that the mine drains the railway cutting.

We were hampered by the high rainfall which has raised the water table in the area and made further progress in the shafts impossible. As a result of this we carried out several trial digs around the woods. We discovered a clay pit which may be associated with the tile industry which flourished in the area. The clay is a very rich red colour and very hard to dig.

In spite of the wet weather we carried on. The shaft to the north of the railway line was now some 12 metres deep and due to the water seeping in, very sticky and difficult to dig. Some very large tree roots were brought up last time and one of the diggers felt a draught coming in through a gap in the side of the shaft. This has yet to be investigated fully. We also carried out further exploration at the other possible shaft site but that proved inconclusive.

South of the railway line where we intended to deploy the pumps, the inrush of water from the railway cutting made any attempt to pump rather futile. We found a drainage culvert, which from its position could well be draining a passage on the north side of the railway. Several people have told us that they played in the adit as children but as yet we have not been able to locate the precise location.

In the autumn I met a small party from Sussex University who were on a field trip and I was going to take them along the adit passage. However, when I shuffled in feet-first I realised that my rubber boots were full of water. The water level was the highest I have seen so far – it was halfway up the entrance slope. There was also water in the bottoms of both shafts. As a result of the high water levels the group had to be content with a look along the passage from the entrance.

January 2001

At the beginning of the following year the south shaft was too wet to attempt anything at all; the adit passage was flooded right up to the entrance drum. After some bailing of the north shaft over a metre was excavated and water was bubbling up. The culvert by the railway line was in full flood as was the spring to the west side of the north shaft. We are fairly certain that the culvert is a drainage channel for the mine. We could not find any evidence of it in the mine but when we were pumping out the bottom of the shaft we ran the hoses along the

passage and the water drained away and came out of the culvert.

At the end of January 2001 we broke through into the adit passage running to the west parallel with the railway. This passage has sleeper marks in the floor, some graffiti and dates. The end has been filled in and it is our intention to open this up and provide a secure entrance.

In February four of us braved the rain and opened up the mine. Peter and I went down and I crawled into the adit. I have been in some mud in my time and I have always thought the Horse Buttocks Mine and Mungo Pot were well up the list to the top ten but this beat them all. After slithering through I did some digging out to enable Peter to get the camera through in a usable state. The passage is sound with no traces of bad ground.

We decided to make a more permanent capping to the shaft on the south side of the railway and to provide an adit entrance on the north side. We also set out to find the destination of the water flowing through the mine. There is a possibility that the shafts may well connect with other parts of the mine below those currently opened.

Access secured

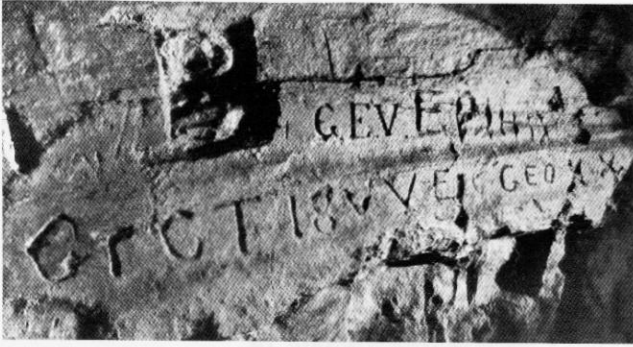
The shaft top on the south side of the railway now has a reinforced concrete cap and metal access cover. A small group spent a wet Sunday wheel barrowing the concrete mix up the footpath and through the woods to the shaft. Earlier in the day the reinforcing rods had been tied in and the area prepared. We used a generator to power the cement mixer. In spite of the appalling weather the job was finished with no mishaps.



Exit crawl in the south adit through 40-gallon oil drum.

Photo by Ted Burgess

The next visit to the site was to fabricate an entrance to the north side adit. A tube was constructed from four plastic drums. The ends were cut out and a steel ladder fabricated to fit inside the resulting tube. A metal deck was constructed, fitted into the entrance and pinned to the rock. The tube was then lowered in and fitted on the metal deck, which has a hole in it and sits about a metre above the base of the passage. The bottom was then cemented in to prevent soil being eroded from around



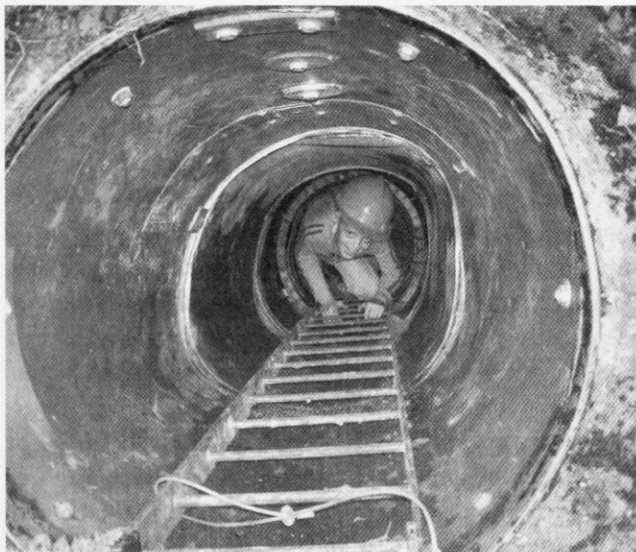
Graffiti in the north adit. Photo by Ted Burgess

the cylinder and the whole structure was backfilled. The filling was consolidated and the top was cemented in. Finally a metal cover was fitted. Unfortunately it rained the whole day so once again everyone got very wet.

It was our intention to see if the shafts went deeper. Topley refers to two seams on the south side, one of which could not be accessed because of bad ground and flooding. We will have to pump out the south adit before we can carry out further investigations on the shaft.

More problems

At the end of January 2002 a small band of KURG members braved the rain and made the customary visit to the mine. On arrival we opened the lid of the newly constructed entrance and discovered that the clay had become completely waterlogged and slumped. The weight against the plastic tubes had squashed them, forcing in the uphill side. I think if we had cancelled our visit because of the weather the situation would have become irretrievable.



Exit on north side still showing some distortion.

Photo by Dave Cushing

The only course of action was to relieve the weight on the tubes by excavating the infill. We soon got down a metre or so. However, it then became an excavation into clay slurry. This was complicated by the relatively small diameter of the digging space and the odd items we had thrown in to fill up the hole. Two large lumps of concrete had to be broken up before they could be extracted.

It was at this point I suggested that as water was the problem why not use water to solve it. About 50 metres up the track is a small stream that runs from one side of the track to the other. Some time ago we had laid drainage pipes under the track to limit the serious erosion of the track. It was decided to divert the stream from its normal course, let it run down the track and into the excavation. This would wash out the sludge and we could then lose it in the mine tunnel.

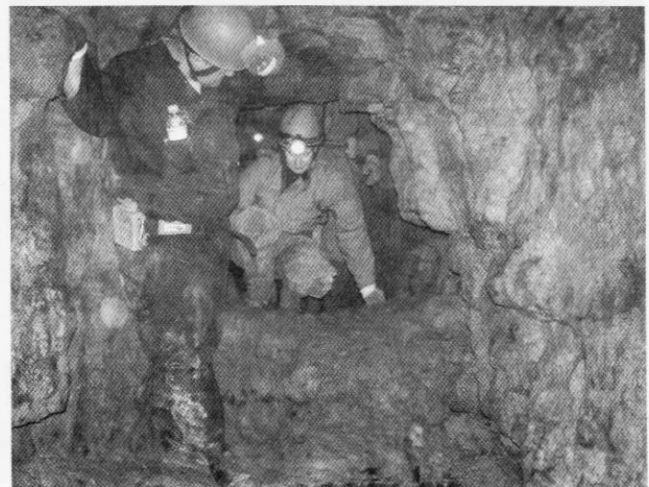
The flow was directed to the right places. After about an hour we had cleared the uphill side of the tubes and could now attempt to get them back into their original shape. We had hoped that they would just pop back into shape but no. By squeezing down the ladder inside the tubes it was possible to brace one's knees against the tube and force it back into shape. Then the stream was returned to its former bed and the area cleared up.

We then had the problem of how to prevent it happening again. As time was getting on we decided to call it a day and go home to think of possible solutions. To leave the site secure we arranged scaffold boards and timbers to prevent a recurrence of the problem before the next visit.

It's bound to come in useful one day...

KURG members are adept at collecting things that others may well regard as junk and putting it to good use. In my back garden were some treads from a ship's companion way which a neighbour of mine was throwing away. Paul thought one day they would come in handy and as everything at some time has a use this was it. To take the pressure off the entrance tube we bolted the treads together in threes to make a square U shape. These were then hammered in to form a bridge around the tubes.

Scaffold boards were then lowered in and the voids filled with expanded polystyrene, the latter to reduce the weight of the filling (if it was good enough for Silbury Hill it was good enough for Snape). In addition the inside of the tube was temporarily braced with timber struts to force it into an egg shape. We added some metal bands from old angle-iron fence posts which were positioned inside

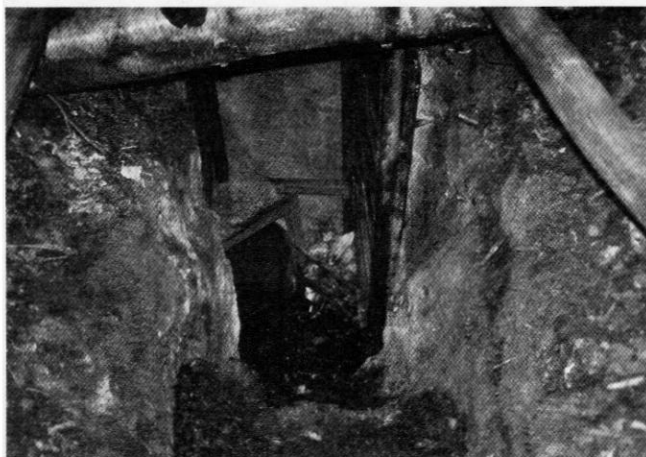


North side of the railway line where the shaft intersects the adit. Photo by Dave Cushing

the tube with the help of a lump hammer and my car jack. At the end of the day the entrance tube was returned to its circular section.

There was a considerable quantity of water in the south passage which reached the roof after a short distance. It seems unlikely that there are any further galleries on the north side below the adit passage. Although the shaft appears to carry on below the floor of the adit, I think that possibly the original shaft carried on down below the present bottom in order to examine potential seams of iron ore. They may then have found problems with water similar to those that have been suggested on the south side. Because of this they backfilled and dug the present adit passage. We will try and prove this one way or another before we return to the south side.

In August, four of us went to see the trial smelt of the Wadhurst ore at the Wealden Iron Research Group's furnace in Sussex. When we got there the process of adding ore and charcoal had been going on for over three hours. Some slag was pulled out when we arrived. They have constructed two large bellows that have to be operated all the time the firing is going on. At about three pm the furnace was raked out but there was no bloom, only slag. The slag will be analysed to see what the problem was. It may be that the ore pile we found at Snape had been rejected or the firing process may need to be modified for our ore. The other possibility is that we may have to identify the seam and dig some ore out.



The excavated adit on the south side of the railway line, now entered through an oil drum. Photo by Dave Cushing

Future plans

We have deepened the shaft but have reached a point where our pumps are unable to cope with the inflow of water. As we are now below track level the mining adviser for RailTrack has asked us not to risk dewatering any cross tunnels that may exist beneath the railway. The north side mine is unusual in that the shaft intersects the tunnel. This gives rise to the possibility that the original diggers were going deeper but for some reason gave up the attempt and dug along a seam level with the track bed. The shaft on the southside however is beside the adit. It is our intention to further investigate the area to

the south of the railway to see if we can find any evidence of lower passages.

If anyone wishes to visit the mine, I can arrange access. *To carry out this work we received a grant from the National Lottery Fund with which we purchased pumps, hose and a generator. We also had an award from the Wealden Iron Research Group which was used to buy materials to secure the entrances.*

Archive Material on Snape Wood From CSS Records Volume 14

The main gallery is about 150 yds in length. This gallery is 4ft 6ins wide and varies in height from 6 to 8ft. Shorter ones at right angles connect parallel galleries to this. Wrought-iron trolley rails about three eighths of an inch thick by 1" ins still remain. Parts of the gallery have fallen in; it is a little below the surface of the ground. As the mine is alongside the Hastings railway, transport of the ore would have been easy. The little inn below (now a private house), the *Miner's Arms*, preserves the memory of this transient enterprise.

Two entrances were filled in to make a road and the remaining postwar shaft filled in after two Scouts were temporarily stuck down it. In 1982 Tony Jarrett and friends examined the site. They found two open-ended depressions at either end of a rake or vein-type of depression. These may have been the original adits. The one nearest the road and footpath may have been that shown in a photograph in Straker's book. A sizeable spoil heap led from this into a nearby garden.

Snape Wood Iron-Ore Analysis – Tim Smith WIRG

We have received a couple of runs of semi quant analysis on the Snape ore and as suspected it is high in SiO₂, but surprisingly not bad in iron.

An average of four runs using X Ray Fluorescopy on a freshly broken surface gave wt % of Fe₂O₃ 50.7%; SiO₂ 39.6; Al₂O₃ 6.1; CaO 0.4. I have spoken with the person who did the analysis and we believe, judging by a micrograph, that the iron may be on the high side due to preferential cleavage along iron-rich planes. However, the Fe₂O₃ content is not far off our other ore (55% Fe₂O₃ on roasting) and I believe it is the high Si content which prevents us making a bloom, all the Fe being 'mopped up' by the SiO₂. Such an analysis could be smelted in a blast furnace, although it would need a lot of lime added as a flux to displace the Fe from the silica. I thus believe this was 'good' ore waiting for shipment rather than a discard.

Simply the mine closed down and it was not worth shipping the small amount of ore remaining to Shropshire (or perhaps it was an excess part of the last load shipped). There may well be better ore at a deeper level, so further exploration is always of value, but we actually proved a very valuable point by not producing a bloom. i.e. that there is a maximum SiO₂ content that can be smelted in a bloomery - and it's less than Snape's.

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